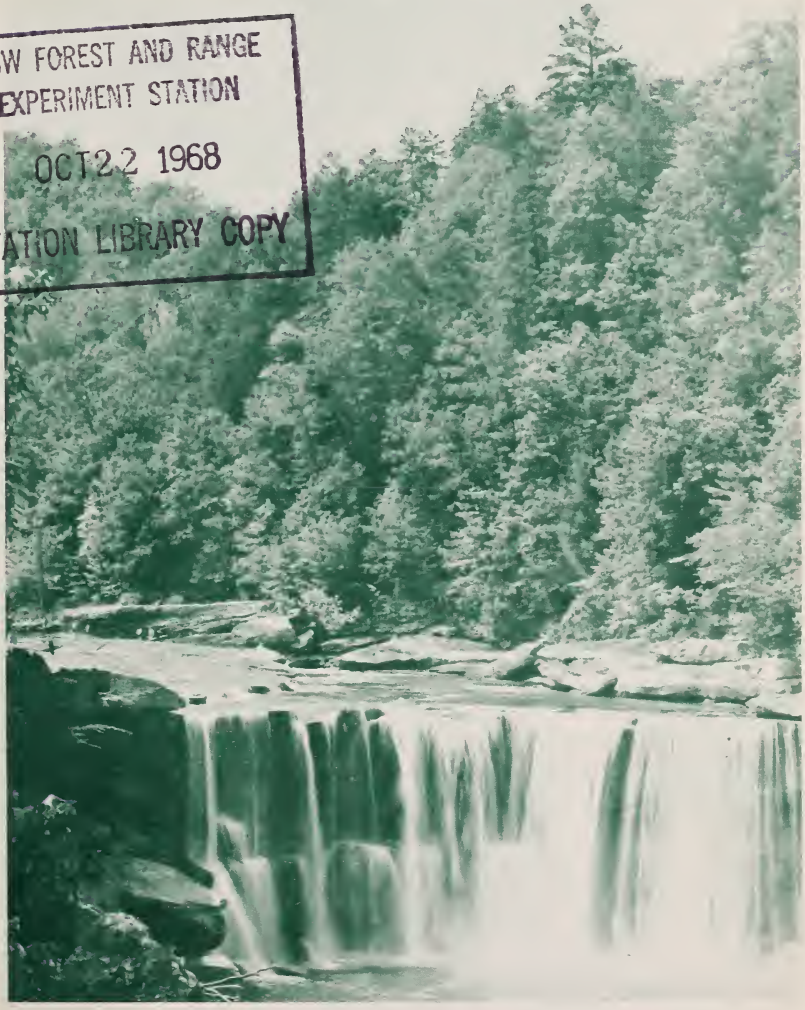
The TIMBER RESOURCES of KENTUCKY



U. S. FOREST SERVICE RESOURCE BULLETIN NE-9
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NORTHEASTERN FOREST EXPERIMENT STATION, UPPER DARBY, PA.
FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE
RICHARD D. LANE, DIRECTOR

PREFACE

THE McSweeney-McNary Forest Research Act of 1928 authorizes the U. S. Forest Service to complete a statewide forest inventory of Kentucky at approximate 10-year intervals as part of the nationwide program of maintaining a current account of our timber resources. The Division of Forestry of the Kentucky Department of Natural Resources and the U. S. Forest Service planned and conducted a new inventory of Kentucky forests. The field work was completed in 1964.

Kentucky appropriated $120,000 for the survey. This contribution, supplementing the Federal funds available for a regular survey, made it possible to intensify the inventory. As a result, we can provide the detailed information needed for making long-range plans to meet future demands. This information will help local communities and forest-based industries use the forest resource more efficiently.

Clarence D. Chase of the North Central Forest Experiment Station directed the inventory. Field data were collected by men of the Kentucky Division of Forestry and the North Central Station under the supervision of Thomas E. Jordan, Jr. Arthur G. Horn compiled timber-cut and product data, and Burton L. Essex compiled forest inventory and growth information. Joseph E. Barnard and Paul S. DeBald of the Northeastern Forest Experiment Station assisted with statistical computations. Results were analyzed and reported by the Northeastern Station.

Personnel of the Eastern Region of the U. S. Forest Service inventoried and provided statistics for the Daniel Boone National Forest. The Tennessee Valley Authority provided men and equipment to assist in surveying areas of their interest. The Soil Conservation Service and the Agricultural Stabilization and Conservation Service provided the field crews with office space and up-to-date aerial photographs. The Kentucky Department of Highways took and provided aerial photographs for parts of eastern Kentucky for which no recent photographs were available. The University of Kentucky and the Kentucky Department of Commerce took an active part in planning the survey and gave valuable assistance with problems that came up during the inventory. Our thanks go to all these organizations.

Additional information about the survey can be obtained either from the Division of Forestry of the Kentucky Department of Natural Resources, or from the Northeastern Forest Experiment Station, Upper Darby, Pa.

COVER PHOTO: Cumberland Falls, Kentucky.

The TIMBER RESOURCES of KENTUCKY

by David A. Gansner

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The Author

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Highlights

OVERALL, Kentucky's timber supply has not changed spectacularly since 1949. The gains in total forest area and total timber volume amounted to less than 5 percent. But significant shifts in timber size occurred. The volume in trees less than 17 inches d.b.h. increased, but the volume in larger trees declined sharply. High-quality volume of many of the State's important timber species continues to decrease.

This trend could be reversed. Volume in trees in the 12-to-16-inch d.b.h. classes increased substantially. Thus today there is a larger base of timber that could become high-grade material. If this immature but sound volume were managed, it would mature more quickly and would more than compensate for recent declines in high-quality volume.

A comparison of the desirable cut estimated for Kentucky with the harvest of growing stock for timber products recorded in 1962 shows that timber cutting could be expanded. Most of the surplus volume is in small and low-grade material that could be used for pulpwood, charcoal, and other products that do not have rigid size and log-quality standards.

Comparisons between the desirable cut and product cut show that, based on the physical supplies of timber, the greatest opportunities to expand forest-based industry are in the eastern part of the State.

Trends in Timber Use

TIMBER — AN IMPORTANT RESOURCE

Almost half of Kentucky's 26 million acres of land area is forested. Although these forests serve a number of uses, here we will consider them primarily as sources of timber for industrial use.

The contribution of timber-based activity in Kentucky is impressive. Forty thousand people were employed in timber-based economic activities in the State in 1958.[1] These activities include the management of forests; the harvesting, primary and secondary manufacturing, transporting and marketing of timber; and the use of timber in construction. In the same year, the estimated value added by these activities was about $220 million or 40 percent more than in 1954 (fig. 1).

[1]Hair, Dwight. THE ECONOMIC IMPORTANCE OF TIMBER IN THE U. S. U. S. Dep. Agr. Misc. Pub. 941, 91 pp., illus. 1963.

Figure 1.—Timber, a vital raw material.

Although significant, these figures, when compared with those of other states, point out a greater potential. For example, of the seven states that border Kentucky, only Virginia and Tennessee harvest more timber. Yet the total value added in timber-based economic activity in Kentucky exceeds that in only one of these border states—West Virginia.

The reason is simple. Kentucky has fewer wood-processing firms, does less transporting and marketing of timber products, and ranks lower in wood construction.

WOOD USE

Wood Use Totaled 137 Million Cubic Feet in 1962

Total wood use has declined in Kentucky since 1948. About 137 million cubic feet of Kentucky wood was used for timber products in 1962—34 percent less than in 1948. Some 650 processors of rough logs and bolts are now active in the State (figs. 2 and 3)—about one-third the total operating at the time of the last inventory. Value of the 1962 output at point of first sale—primary wood-using plants, timber dealers, and other local points of delivery—was about $30 million.

A comparison of Kentucky wood output by products—1948 and 1962—is shown below:

Product	*Unit of measure*	*1948*	*1962*	*Change (percent)*
Sawlogs	M board feet[1]	508,240	460,380	−9
Veneer logs	M board feet[1]	9,614	12,455	+30
Cooperage logs	M board feet[1]	44,042	21,017	−52
Pulpwood	Standard cords[2]	47,225	82,165	+74
Fuelwood	Standard cords[2]	1,506,000	680,000	−55
Fence posts	M pieces	13,544	3,600	−73
Mine timbers	M cubic feet	16,497	4,336	−74
Other[3]	M cubic feet	4,006	3,401	−15
All products	M cubic feet	208,122	137,393	−34

[1]International ¼-inch rule.

[2]Rough wood basis.

[3]Includes charcoal wood, poles and piling, handle logs, and other miscellaneous industrial wood.

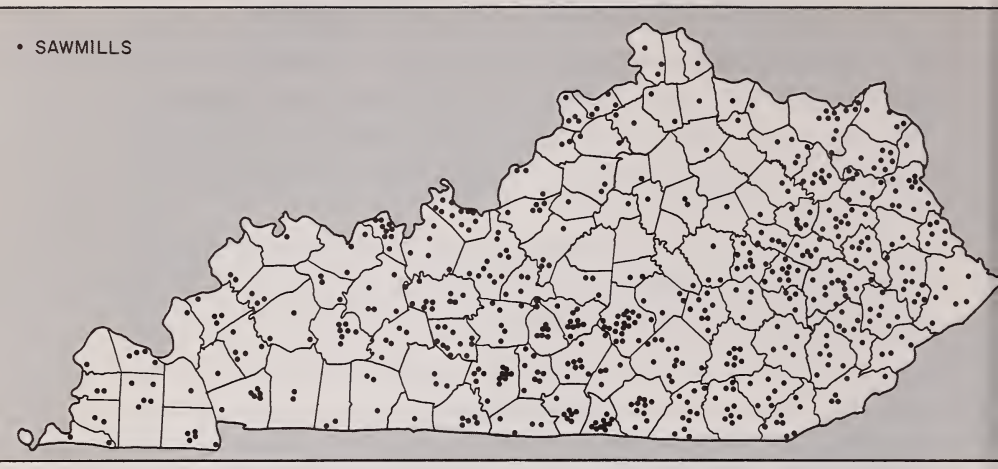
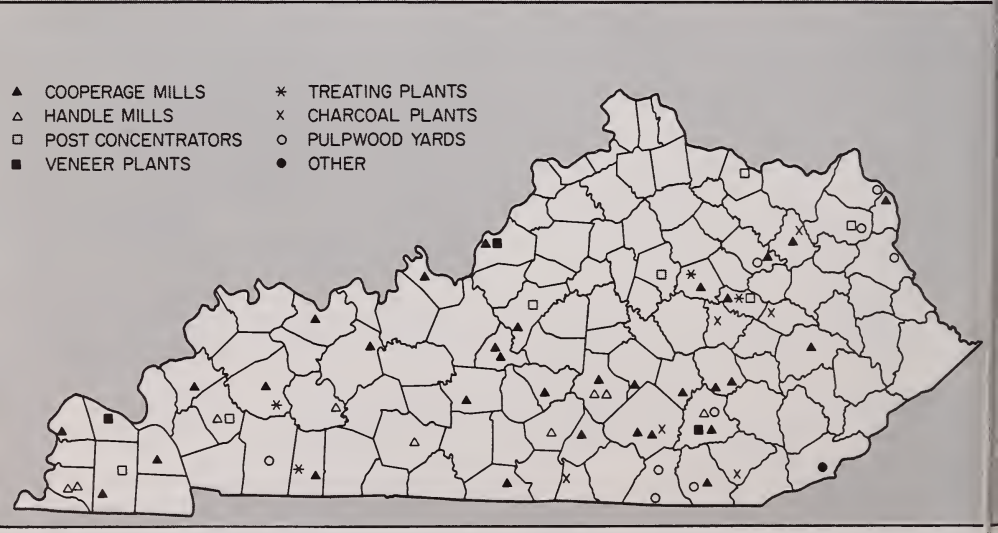


Figure 2.—Location of Kentucky's sawmills. Source: Primary wood industries of Kentucky.

Figure 3.—Location of Kentucky's other primary wood-using industries, 1963. Source: Primary wood industries of Kentucky.



Lumber Logs — Kentucky's Main Forest Product

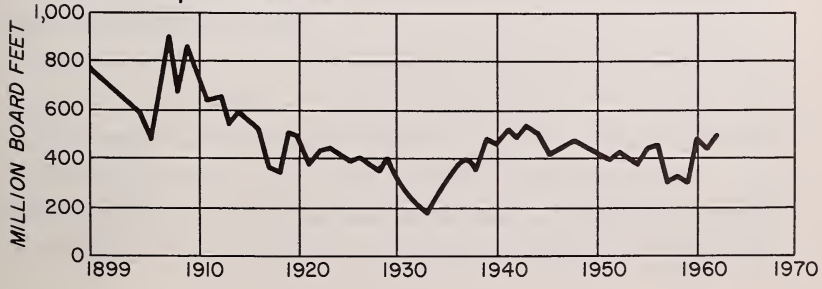
More Kentucky wood is used for lumber and lumber items than for any other product. In 1962, 460 million board feet of sawlogs was harvested, and 466 million board feet of lumber was produced by local mills.

Annual lumber production has ranged from nearly 1 billion board feet at the turn of the century to 200 million board feet during the depression (fig. 4). Modern highs of more than 500 million board feet per year were recorded during World War II. In the last decade, production has fluctuated between 300 and 500 million board feet; the lowest production occurred in 1957-59.

The oaks have remained the most important lumber species. About 45 percent of the lumber produced in 1962 was oak; yellow-poplar and beech ranked next. Softwood lumber production amounted to only about 25 million board feet, and shortleaf pine accounted for just about half of this total.

Kentucky's lumber industry has changed appreciably since the last survey. More mills were operating in 1948, but most of them were small and portable, and few provided dependable year-long employment. Today the mills are larger and the industry has become more permanent. Only a handful of the 2,000 mills that were operating in 1948 each produced more than a million board feet of lumber annually. In 1962 more than 100 mills (about

Figure 4.—Lumber production in Kentucky, 1899-1962. Sources: Steer, Henry. Lumber production in the United States, 1799-1946, U. S. Dep. Agr. Misc. Pub. 669, 233 pp. 1948; and lumber production statistics published by the U. S. Dep. Commerce.



one-fifth of those operating) produced at least this much lumber, and a few produced more than 5 million board feet. Average annual production was about 800,000 board feet per mill in 1962 compared with 250,000 board feet in 1948.

Use of Fuelwood, Cooperage Logs, Mine Timbers, and Fence Posts Declines Sharply

At the time of the last forest inventory fuelwood accounted for almost half of the total wood production. But the 680 thousand cords of fuelwood used in 1962 was less than half the amount of fuelwood used in 1948. In those days wood was still used extensively for heating and cooking. But fuelwood is becoming a luxury item used primarily in residential fireplaces. Oil, gas, and coal have rapidly replaced wood in the factory and in the home.

Because new technology, changes in consumer buying, and new packaging techniques have reduced the demand for cooperage, the production of cooperage logs and bolts has declined significantly. In 1948, 87 cooperage mills were operating in Kentucky. Now there are one-third as many mills. The State produced 44 million board feet of cooperage logs and bolts in 1948. The output of cooperage logs in 1962 and 1964 was about half of that.

Practically all the volume produced today is white oak that goes to local stave and heading mills where it is sawed into stock for bourbon barrels. Some timber is cut in Kentucky for slack cooperage. All of it is shipped to a mill in an adjacent state.

Despite declines in production, Kentucky still ranks with Missouri, Illinois, Tennessee, and Arkansas as one of the leaders in the production of cooperage logs (fig. 5).

Because mining practices have changed, the use of wood in mining has declined sharply in the last decade. The 4.3 million cubic feet of wooden mine materials produced in Kentucky in 1962 was only one-fourth of the 1948 total. Conveyor belt systems and rubber-tired vehicles have been replacing rail cars, thereby reducing the need for mine ties. Steel arches and metal roof bolts are being used instead of mine props. Also, the ex-

Figure 5.—Kentucky still ranks among the Nation's leading States in the production of cooperage.

tended use of wood preservatives has lengthened the service life of mine timbers.

Fence-post production is down substantially. Kentucky produced only 3.6 million fence posts in 1962 compared to 13.5 million in 1948. Greater and more efficient use of preservatives has made wooden fence posts more durable, and steel and other materials have been substituted for wood. Changes in farming methods have also lessened the need for fence posts.

Pulpwood, Charcoal, and Veneer Log Production is Up

As of 1963 Kentucky had no pulpmills, yet pulpwood production between surveys increased more than the production for any other major forest product. The 82 thousand cords of pulpwood produced in 1962 was 74 percent more than in 1948.

Chipped slabs, edgings, and similar byproducts from sawmills and other wood-using plants continue to make up an ever-increas-

ing share of the total pulpwood output. But roundwood logs still make up most of the total output. The harvest of roundwood in Kentucky averaged less than 50 thousand cords per year in the 1950's but has increased to more than 70 thousand cords per year in the 1960's. The harvest of pine pulpwood has increased recently. In 1948, very little pine pulpwood was cut; now pine represents more than half of the total harvest.

The charcoal industry in Kentucky was relatively unimportant in 1948 and through the early 1960's. But, as the needs of outdoor chefs and industrial users grew, Kentucky rapidly became one of the Nation's leading charcoal producers. Expansion has been recent. In fact, most of the growth took place after the timber-utilization data used in this report were gathered. In 1961 three plants in Kentucky were producing charcoal. The industry used about 20,000 cords of wood and produced 8,000 tons of bulk charcoal. Six plants are active now; and production has increased several-fold.

There are half as many veneer plants in the State now as in 1948, yet the annual harvest of veneer logs has increased about 30 percent. Production is up primarily because shipments of veneer logs to adjacent states and foreign ports increased. In 1948 less than 4 of the 9.6 million board feet of veneer logs harvested from Kentucky was sent to mills outside the State. About 8 of the 12.4 million board feet produced in 1962 was sent outside the State. Only one-third of the 1962 veneer log output was container material. The production of container veneer logs, used in the manufacture of baskets and crates, has slackened because substitute materials like fiberboard and plastic have claimed larger shares of this market. But this decline was more than offset by increased harvests of face and commercial veneer logs for high-grade plywood panels and furniture stock.

Black walnut is now the species most heavily used for veneer logs. In 1948 less than a million board feet or 10 percent of the production was walnut. The 5 million board feet of walnut veneer logs harvested in 1962 represented about 40 percent of that year's total production. Yellow-poplar and cottonwood rank next to black walnut as important veneer species.

HARVEST OF GROWING STOCK

Harvest of Growing Stock for Timber Products Exceeds 120 Million Cubic Feet

About 123 million cubic feet of growing-stock volume was cut for timber products in 1962.[2] (Relationships of timber supply and demand ordinarily are expressed in terms of growing stock because this kind of timber is suitable, under present standards, for pulpwood, sawlogs, and other industrial products.)

Not all of the 123 million cubic-foot harvest was utilized for products. Some 19 million cubic feet of it was left in the woods as residue. Logging waste is generally greater for products with rigid quality specifications and where logging for more than one product is not practiced. For example, about 45 percent of the sound growing stock felled for use as handle stock went unused in 1962. Most Kentucky handle stock comes from hickory, a species with few alternative commercial outlets. Loggers concentrate on cutting straight, clear bolts for this one product; and sound timber that does not meet the size and quality standards for handle stock is left in the woods.

The 104 million cubic feet of growing stock used for products accounted for three-fourths of Kentucky's total output of wood for timber products in 1962. The remaining output (33 million cubic feet) came from non-growing stock sources like limbwood; cull, dead, and sapling-size trees; noncommercial forest land; and plant byproducts. Nongrowing-stock material was used mainly for fuelwood, which does not require wood of growing-stock quality.

[2] The timber harvest reported here does not represent the total amount of volume removed from commercial forest land (see table 43). For example, some timber was pushed and burned in land-clearing and strip-mining. Also, some tracts that retained their tree cover were set aside as parks, flooded by new reservoirs, developed for pasture, or converted to some other non-commercial forest or nonforest use. The 1963 forest inventory did not measure such losses or shifts in commercial forest area and timber volume.

Most of the Cut from Trees of Sawtimber Size

Four-fifths of the total growing stock cut for products in 1962 was from sawtimber-size trees. More than half of the total harvest came from trees 15.0 inches to 24.9 inches d.b.h. Included in the 1962 cut of growing stock were 632 million board feet of sawlog size material.

The 25 million cubic feet of poletimber volume harvested in 1962 was less than half of the 1948 total. The volume of poletimber used for pulpwood has increased steadily. But this gain has been more than offset by sharp declines in the production of fuelwood, fence posts, and mine timbers—products that accounted for the greatest drain on poletimber at the time of the last survey.

Almost half of the 1962 cut was from oaks, the most plentiful species in the State. Yellow-poplar, hickory, beech, and shortleaf pine followed in order of importance and accounted for another 30 percent of the total.

The 1962 harvest of growing stock for timber products represented less than 2 percent of Kentucky's total inventory. It averaged about 10 cubic feet of growing stock and 50 board feet of sawtimber volume per commercial forest acre. Cutting was heaviest in the Western Coalfield unit where many of Kentucky's largest sawmills are found. Per-acre cutting rates in this region are just about double the averages for the whole State.

Trends In The Timber Supply

FOREST AREA

A Slight Increase in Commercial Forest Area

Not all of Kentucky's 11.9 million acres of forest land is commercial forest land. Some 81,000 acres is forest reserved from cutting like that in Mammoth Cave National Park. Another 62,000 acres is woodland on sites too poor to produce industrial

Figure 6.—Many acres of abandoned submarginal farm land are coming back into brushy forest cover.

timber. This leaves 11,712,800 acres of commercial forest land —2.3 percent more than in 1949.

The rather small overall gain in commercial forest area between surveys does not reflect some of the important shifts at local levels. Forest area increased significantly in the Cumberland Mountain and Western Coalfield regions of the State where many abandoned submarginal fields and pastures have, through planting and natural regeneration, become restocked with trees. Much of this new forest is in a brushy transitional stage of development and will not become stocked with merchantable timber for some time (fig. 6). Forest area declined most in the Bluegrass Region. In this region, which is already the least for-

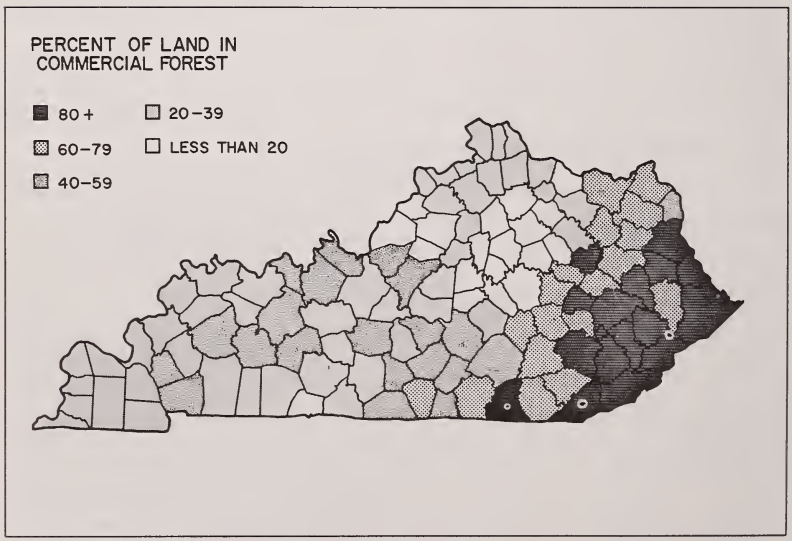
ested and most highly developed area of Kentucky, woodland continues to give way to agriculture, industry, and urbanization. Changes in the survey units of the State were:

Survey unit	*Commercial forest in 1963 (thousand acres)*	*Change from 1949 (percent)*
Western	721	(*)
Western Coalfield	1,843	+5
Pennyroyal	2,167	+3
Bluegrass	1,128	−8
Northern Cumberland	1,858	+6
Southern Cumberland	2,201	+5
Eastern	1,795	(*)
Total	11,713	+2

*Insignificant.

The Eastern Unit is the most heavily forested. Here commercial forest occupies 84 percent of the land area, and no county is less than 74 percent forested. At the other extreme is the Bluegrass Region where only one-fifth of the total land area is in woodland, and counties less than 15 percent forested are common (fig. 7).

Figure 7.—Percent of land forested, by counties, 1963.



Hardwood Types Predominate

Two hardwood types—oak-hickory and central mixed hardwoods—account for three-fourths of the commercial forest land. In the rough highlands of extreme eastern Kentucky, nine-tenths of the forest cover is in these types. The species composition changes somewhat further west. In the Cumberland region, these types still predominate but stands of oak mixed with pine occur more frequently. In central Kentucky stands of hardwood mixed with red cedar are common, especially on drier sites. And in the extreme western part of the State, where the topography begins to level off and stream valleys become wider, bottomland hardwood species like elm, cottonwood, and sweetgum begin to show up in greater abundance. For example, in the 11-county Western unit elm-ash-cottonwood forests and oak-gum-cypress forests represent almost one-third of the total commercial woodland.

Stands in which softwoods are a major component of the stocking represent less than 5 percent of the total commercial forest area. This is not to say the softwood resource is unimportant. Quite to the contrary; where they are found, softwoods contribute significantly to local timber economies. For example, in the southern Cumberland unit, the harvest of shortleaf pine volume alone exceeds that of any other individual species.

Little Change in Ownership Pattern

The ownership situation in Kentucky has not changed appreciably since the last survey.

Forest area in private ownership has increased by 200,000 acres or 2 percent, but still accounts for 94 percent of the total commercial forest land (fig. 8). People or companies operating wood-using plants own about 2 percent of the privately owned forest. These people are familiar with the timber resource and are at least aware of the results of sound forestry.

A plurality of the private forest is owned by some 200,000 people with small holdings (few of their tracts are larger than 100 acres) who are not actively interested in forest management.

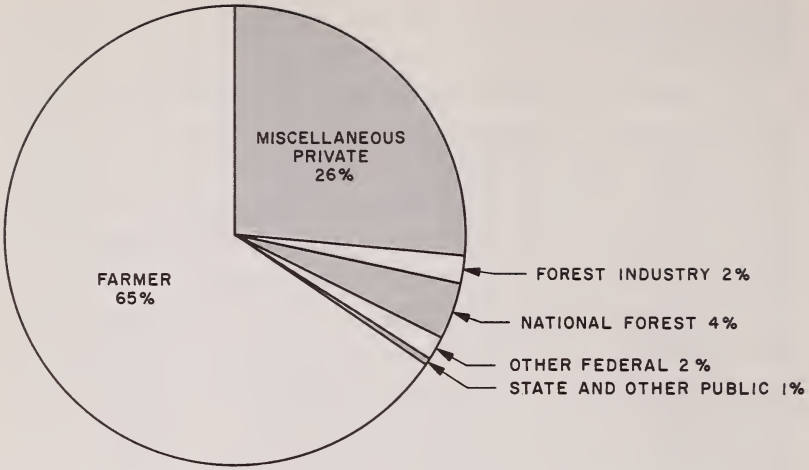


Figure 8.—Distribution of commercial forest area by ownership class, 1963.

Because they own such a large share of the woodland, how they treat their land today primarily will determine how the forest resources of Kentucky will develop in the future.

Forest area in public ownership has increased by 66,000 acres or 10 percent. Much of Kentucky's 742,000 acres of publicly owned commercial forest is under some form of management aimed at sustained yield production. Some 453,000 acres of it is in the Daniel Boone National Forest, administered by the Forest Service. The Forest Service, by planting, purchase, and exchange, has added 47,000 acres of commercial forest to the Daniel Boone since 1949. The State of Kentucky owns 77,000 acres of commercial forest—24,000 acres more than at the time of the first survey. Some 47,000 acres of this woodland is in state forests administered by the Kentucky Division of Forestry. The remaining publicly owned forest is in Army installations, wildlife refuges, and other Federal, state, county, and municipal holdings.

TIMBER VOLUME

Between inventories, growing-stock volume increased 4 percent,[3] an average rate of about 20 million cubic feet per year. Sawtimber volume increased 6 percent, about 105 million board feet per year.

Average Size of Timber Smaller

Since 1949 the volume of small timber increased while the volume of big timber declined. The volume of growing-stock trees less than 17 inches d.b.h. increased 625 million cubic feet or 12 percent; the most impressive gains took place on trees in the 11.0 to 16.9 inch d.b.h. classes. But the volume in trees 17 inches d.b.h. and larger declined 331 million cubic feet or 18 percent (fig. 9). Improvements in forest protection have been primarily responsible for substantial boosts in the numbers and volume of small trees.

The size distribution of sawtimber has changed, also. The volume of sawlog material in trees less than 17 inches d.b.h. increased 21 percent. But the volume in larger trees—the size preferred by most of the local sawmills, cooperage mills, and other primary wood-using industries—declined 12 percent:

	1949		*1963*		*Change*	
Diameter class (inches)	*(Million board feet)*	*(Percent of total)*	*(Million board feet)*	*(Percent of total)*	*(Million board feet)*	*(Percent)*
Less than 16.9	13,657	55	16,499	63	+2,842	+21
17.0 and larger	10,998	45	9,649	37	—1,349	—12
Total	24,655	100	26,148	100	+1,493	+6

Regional Changes in Volume

Changes in sawtimber volume were not distributed proportionately across the State. Noteworthy gains occurred in the Northern Cumberland and Western units where growth has

[3] The 1949 estimates of growing-stock volume are not directly comparable with those of 1963 because they did not include merchantable material in the upper-stem portion of hardwood sawtimber-size trees. The 1949 data had to be adjusted to permit comparisons.

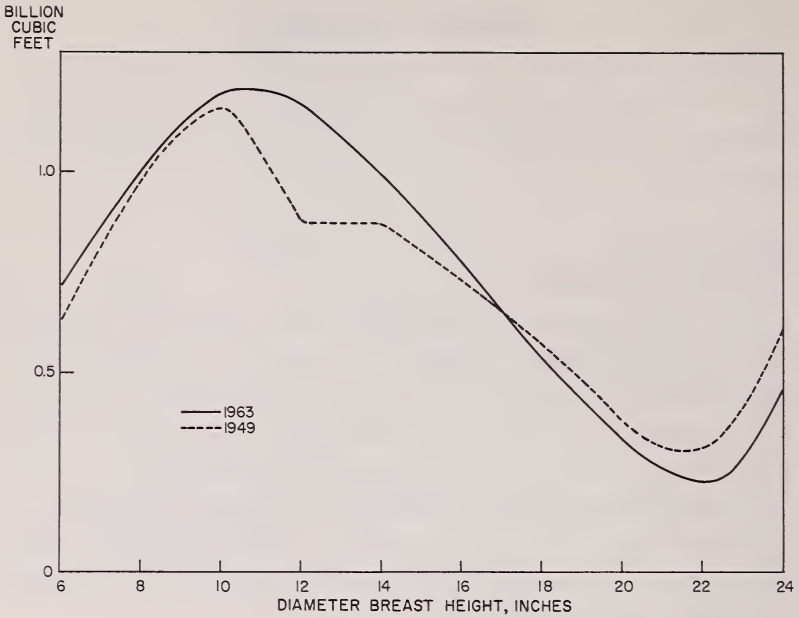


Figure 9.—Change in growing-stock volume by diameter classes between 1949 and 1963.

exceeded cut for nearly all sizes of timber in recent years. Volume in the Eastern and Bluegrass survey units declined significantly. Shifts in land use and timber harvesting have reduced forest acreage and average forest stocking in both of the latter areas.

The distribution of sawtimber volume and changes in each of the seven survey units of the State since 1949 are shown below:

Survey unit	*Sawtimber volume in 1963 (million board feet)*	*Change from 1949 (percent)*
Western	2,611	+54
Western Coalfield	4,234	+13
Pennyroyal	4,179	—3
Bluegrass	1,045	—18
Northern Cumbeland	3,935	+47
Southern Cumberland	5,098	+4
Eastern	5,046	—16
Total	26,148	+6

More Oak and Yellow-Poplar — Less Beech and Black Walnut

The species composition of Kentucky's forests has changed somewhat since 1949. Volumes of oak, hickory, yellow-poplar, and maple—all heavily used timber species—have increased.

Yellow-poplar made the most impressive gain (fig. 10). This species, which is quick to occupy cut-over areas and has been favored in most cultural operations, grows fast once it becomes

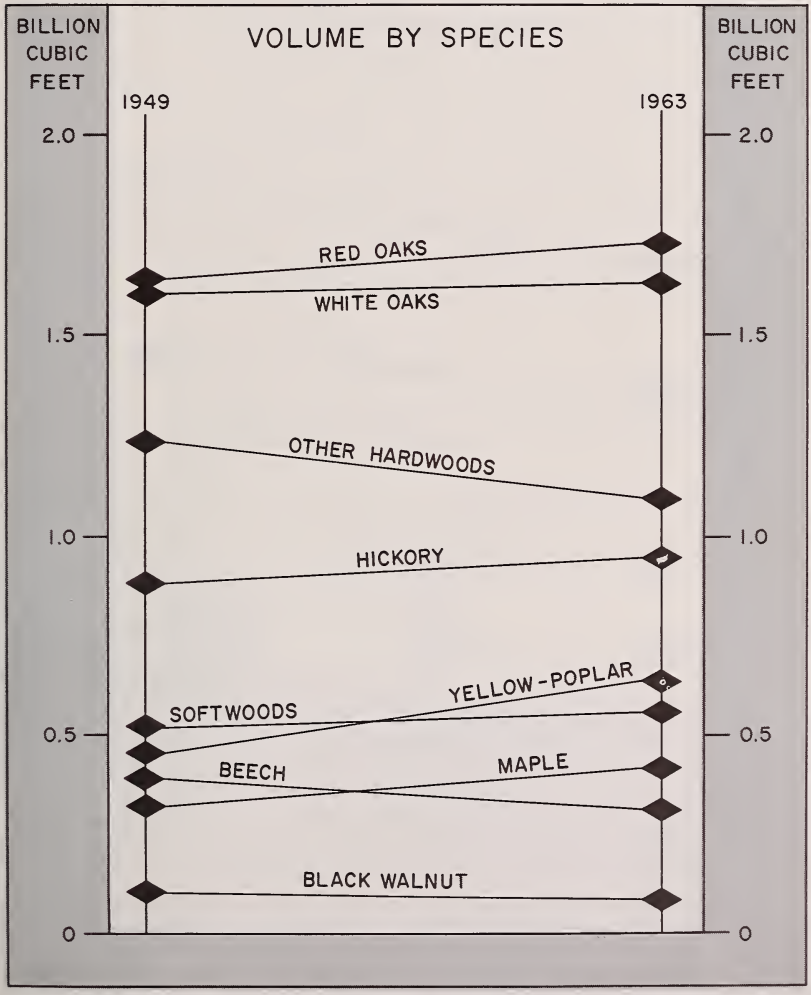


Figure 10.—Change in growing-stock volume by species groups, 1949-1963.

established. There is now almost half again as much yellow-poplar growing-stock volume in Kentucky as there was in 1949. Despite heavy cutting, the volume of yellow-poplar sawtimber also has increased substantially and now exceeds that of beech (fig. 11).

At the same time heavy cutting has led to sharp reductions in the volume of beech. The volume of beech timber, which ranks behind only the oaks, hickory, and yellow-poplar in total

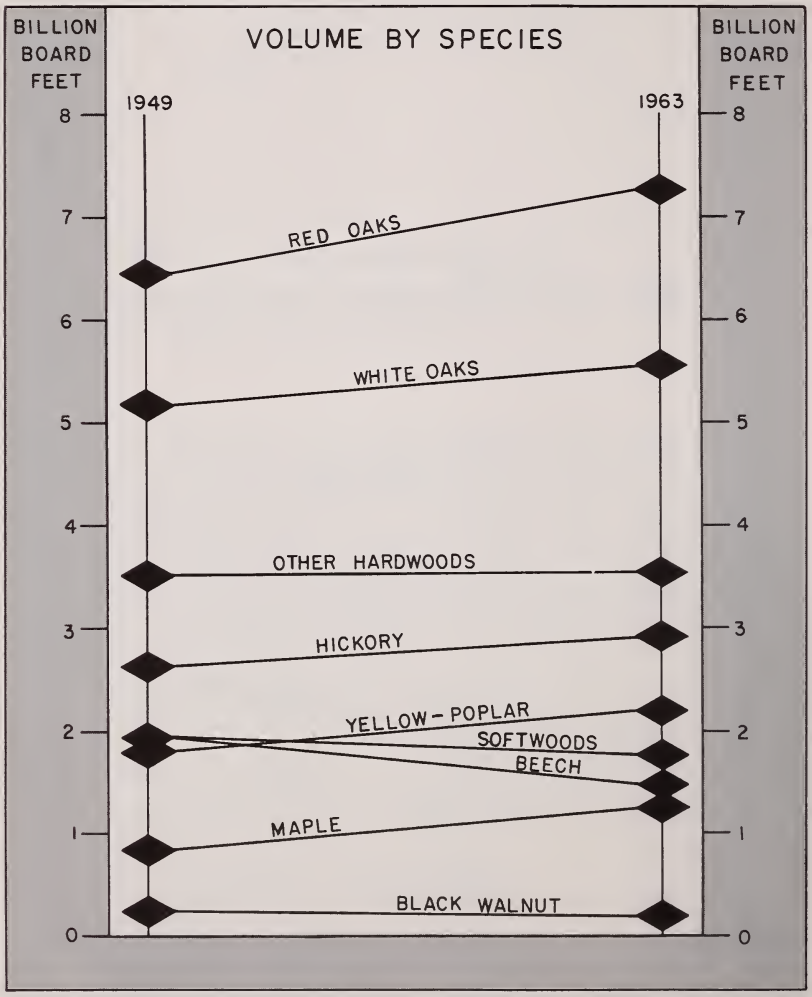


Figure 11. — Change in sawtimber volume by species groups, 1949-1963.

use, is down more than 20 percent; and beech continues to be cut at a faster rate than it is growing.

The volume of black walnut on commercial forest land has been reduced about 30 percent (fig. 12). Much of Kentucky's black walnut volume was not tallied because it grows in fence rows, pastures, and other nonforest areas. A special survey has estimated the walnut volume on nonforested lands at approximately 20 million cubic feet, including some 60 million board feet of sawlog material. This is almost one-third as much walnut volume as that found on all commercial forest land in Kentucky.

About half of the State's nonforest walnut is in the sparsely forested Bluegrass region. This means that the volume of black walnut on nonforest holdings in the Bluegrass is as great as the amount growing in its commercial woodlands.

The inventory of softwoods is up, but only because the volumes of Virginia pine and pitch pine increased sharply. The sawtimber volume of shortleaf pine, Kentucky's most important

Figure 12.—Black walnut supplies have dwindled rapidly because cutting has been excessive.

softwood species in terms of utilization, has been reduced almost 30 percent. Shortleaf pine accounted for one-half of the total softwood sawtimber volume in 1949, but it accounted for less than 40 percent of the 1963 total. The volume and numbers of small shortleaf pine trees (less than 11 inches d.b.h.) increased greatly between surveys, but this increase was more than offset by cutting and mortality in larger timber. The end result was an overall decline in all shortleaf pine growing stock.

With all these changes in volume, the average stocking in Kentucky's forests improved. On the average, volume is up approximately 10 cubic feet of growing stock and 80 board feet of sawtimber per commercial forest acre.

There are also some 270 million cubic feet of non-growing-stock material in Kentucky's commercial forests (fig. 13). This is sound volume in cull and dead trees. Much of it is small and/or low-quality timber that would hardly be worth the cost of recovery for most industrial products, but it can be used for fuelwood, charcoal, and pulpwood chips. Because this material is undesirable, it can be used immediately; the removal of any of it from the forest would lead to net improvements in forest productivity.

Fewer High-Grade Sawlogs But Quality Potential Greater

Because so much of the timber harvested in Kentucky is used for sawlogs, veneer logs, cooperage bolts, and other products that demand large, straight, and relatively clear logs, higher quality logs are in great demand.

Because log size mainly determines log quality, the sharp declines in big timber indicate there are fewer high-quality sawlogs in Kentucky's commercial forests now than in 1949. This is true for nearly all the important timber species—the oaks, yellow-poplar, beech, black walnut, and shortleaf pine. Even so, a relatively high proportion of the State's volume is still in large, high-quality stock. Almost two-fifths of the total sawtimber volume is in trees 17 inches d.b.h. and larger, and 12 percent of the total is in trees over 23 inches d.b.h.

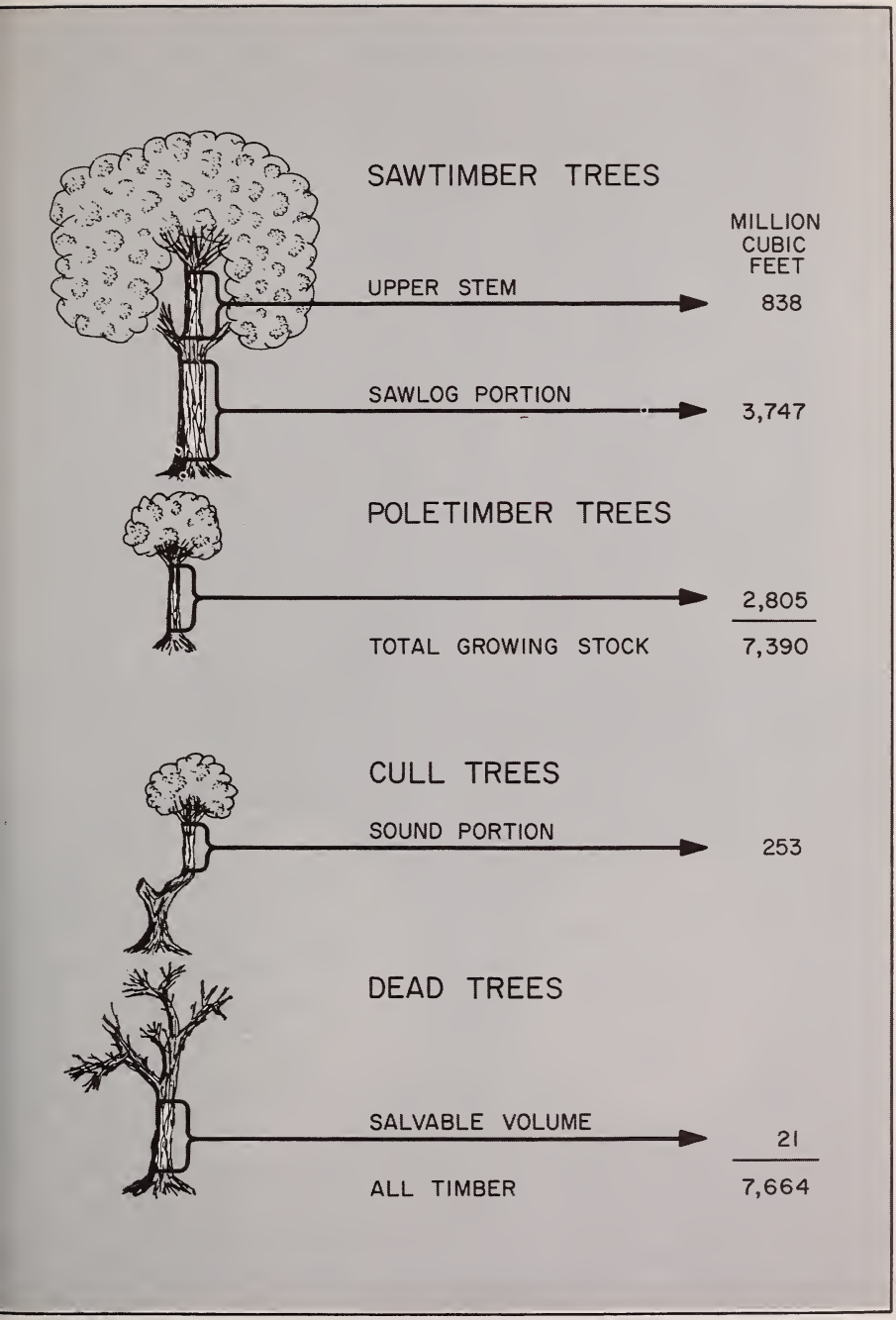


Figure 13.—Distribution of all timber on commercial forest land by kind of material, 1963.

A special log-grade study to evaluate the quality of Kentucky's timber supply showed that more than 10 billion board feet or two-fifths of the standing sawlog volume is log grade 2 or better quality and nearly half of this is grade-1 material (fig. 14). This is the timber that yields standard lumber, cooperage, veneer, handle stock, and other high-grade industrial products. Current harvests of this volume from Kentucky are about 400 million board feet annually. So, even if no growth occurred, the present inventory of grade-1 and grade-2 logs would be enough to satisfy current cutting rates for 20 to 30 years.

Perhaps no trend carries more import for Kentucky's timber economy than the sharp volume increases in trees in the 12- to 16-inch d.b.h. classes (fig. 15). Much of this volume is classified log grade 3 but only because it is smaller than the minimum size required for the higher grades. If these immature but sound trees were managed they would mature more quickly and would more than compensate for the recent declines in large sawtimber.

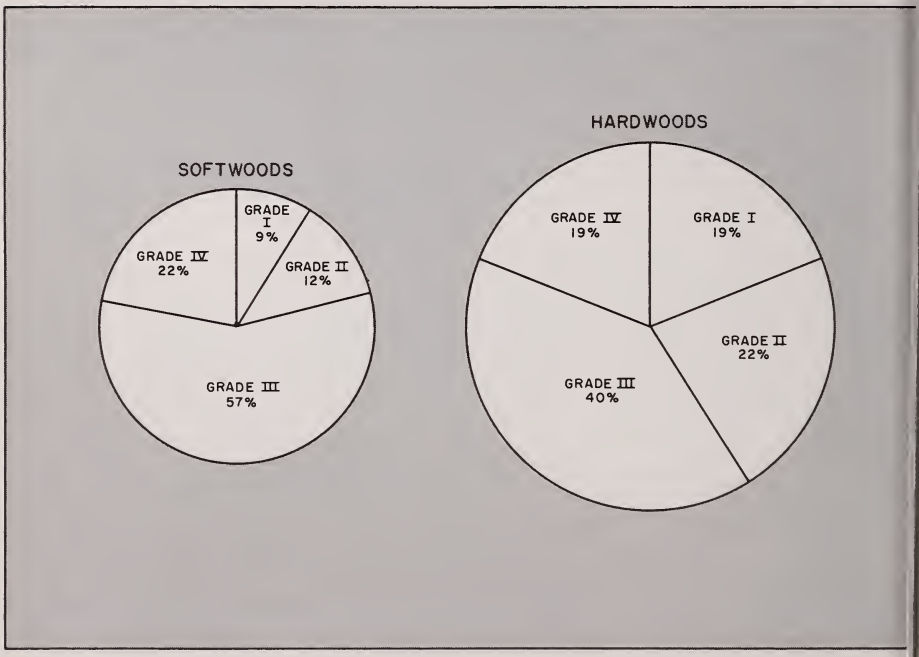


Figure 14. — Distribution of sawtimber volume by log grades, 1963.

Figure 15.—Volume of immature trees with high-quality potential has increased sharply.

This timber also offers an excellent opportunity for large and timely returns per dollar invested in forestry. Its development should be a matter of prime concern to Kentucky's forest managers.

Productivity is Below Potential But Timber Supply is Increasing

Kentucky's productivity is below its potential. Nine-tenths of the timberland in Kentucky can produce more than 50 cubic feet per acre per year, and more than half of it can produce more than 85 cubic feet per acre per year (potential expressed in mean annual growth at culmination of increment in fully stocked stands of desirable trees). Current production averages are well

below this. Substantial increases in productivity and quality will not take place until stocking improves. Poor growing stock and culls are occupying space that could be growing thrifty crop trees (fig. 16). Only 38 percent of the total commercial forest is now well stocked with merchantable or potentially merchantable trees. And only 14 percent is well stocked with desirable growing-stock trees or is expected to attain this stocking without treatment in the near future. An average of one out of every seven live trees of merchantable size (5 inches and larger) is too rough or rotten to be used for industrial products.

Figure 16. — Opportunities for improving stocking and timber productivity are evident in stands like this throughout the State.

Natural mortality also depresses timber growth. Fire, insects, diseases, and other agents were killing timber at an estimated rate of about 14 million cubic feet of growing stock per year in 1962. Thus total mortality amounts to a volume loss that is greater than the harvests of some of Kentucky's most important timber species.

Even though productivity is lower than it might be, volume is increasing.

The best measure of current volume change is the average of volume change that occurred between 1949 and 1963. The 1963 inventory did not measure some important components of inventory change. For example, since 1949 many acres of land have shifted into and out of the commercial forest category. Merchantable volume got pushed and burned in the clearing of land for farms, cities, and highways. Also, some tracts of standing timber were set aside for state and roadside parks or became converted to other nonforest or non-commercial uses. At the same time wooded pastures and other nonforest holdings were left idle, suddenly to become part of the commercial forest resource again.

Between inventories growing-stock volume increased at an average rate of about 20 million cubic feet per year. Sawtimber volume increased about 105 million board feet per year. These average rates incorporate all components of volume change (increment and removal) between inventories.

Desirable Cut and the Timber Balance

DESIRABLE CUT

A desirable cut of 196 million cubic feet of growing-stock, including 809 million board feet of sawtimber, has been computed for Kentucky.

A desirable cut represents the volume of merchantable timber that can be harvested annually in the next decade while a healthy balance of age classes is established and maintained and the productivity of the State's forests is improved.

The long range goal of the desirable cut is to establish a regulated forest producing a sustained yield of timber. Desirable cut, then, is calculated chiefly from a silvicultural viewpoint—what is good for the stand in the long run. Such goals are not always compatible with those of forest industries and woodland owners seeking immediate profits or of small communities striving for rapid economic development. For example, a Kentucky mill operator competing for a steady supply of quality raw material would hesitate to reduce the utilization of high-grade logs for the sake of long-range improvements in forest productivity. At the same time, a small woodland owner would be reluctant to invest in stand-improvement cuttings if he had no markets for the timber cut or no promise of a return on his investment in the near future.

Despite its shortcomings, the desirable cut has practical application. It provides a silvicultural standard that can be compared with current cutting to indicate generally where shortages and surpluses occur in the timber supply. And, because it is based on current management objectives, the desirable cut provides a more meaningful way to gage timber excesses and deficits than simple comparisons between growth and cut.

MORE TIMBER COULD BE HARVESTED

Comparisons between desirable cut and product cut indicate that more timber could be harvested from Kentucky. The estimated desirable cut of growing stock exceeds the volume cut for timber products in 1962 by about 70 million cubic feet (fig. 17). However the degree of available surplus is not the same for all species and sizes of timber, and the surplus also varies for different regions of the state.

Comparisons between desirable cut and product cut show a large surplus of poletimber volume—material that can be used for pulpwood, charcoal, particle board, and other products that do not have rigid size and log-quality standards. Based on the available wood supplies, the opportunities for expanding industries that use this kind of timber appear excellent, and the addition or expansion of any such firms would benefit both the

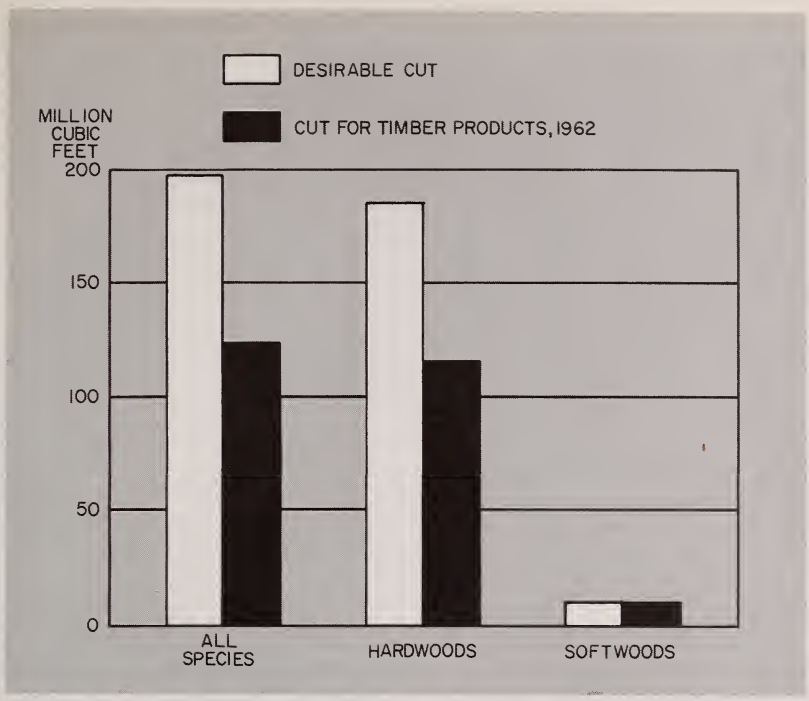


Figure 17.—Comparison of the desirable cut of growing stock with that actually cut for timber products in 1962 for major species groups.

timber resource and the local economy (fig. 18). The desirable cut of sawlog material also exceeds the actual cut but by a lesser amount.

The desirable cut of sawtimber volume is about 180 million board feet greater than the amount cut for products in 1962. Indications are that sawtimber harvests could be increased for most of Kentucky's important timber species (fig. 19). The surpluses of oak and hickory alone could support several new wood-using establishments. Shortleaf pine, maple, ash, and blackgum also could sustain additional cutting.

But a few important species are being cut too heavily and deficits are greatest in the larger diameter classes where high quality is concentrated. Excessive cutting of immature high-grade black walnut is particularly alarming, and if the trend continues supplies of this valuable timber may soon be depleted. Yellow-

Figure 18.—A large surplus of small and low grade timber is available for cutting.

poplar sawtimber also is being overcut even though this volume is increasing rapidly. Most of the increment in yellow-poplar sawtimber is on small trees that are not ready for harvest.

Markets, transportation systems, labor supplies, tax structures, incentive programs, and attitudes of woodland owners all influence the decision to locate new wood-using industries in a particular area. But a major factor is the existence of a sustaining timber supply. Comparisons between desirable cut and product

cut show that the Eastern unit of the State has the greatest surplus of timber; so, based on the timber supply, the best opportunities for expanding wood-using industries are there. Similar situations exist in the Northern and Southern Cumberland units.

At the other extreme is the Bluegrass region. A large deficit here is due more to a low desirable cut than to heavy cutting. Most of the region's stands are immature and poorly stocked and only a small percent will be ready for harvest or will require commercial thinning in the next decade. Cutting in the Bluegrass should be reduced until timber stocking improves and the distribution of age classes is more balanced. Comparisons of desirable cut and the 1962 cut for products, for each of the seven survey units of Kentucky are shown in these tabulations:

GROWING STOCK

Survey unit	*Desirable cut (million cubic feet)*	*Cut for products 1962 (million cubic feet)*
Western	13.9	9.1
Western Coalfield	36.5	33.7
Pennyroyal	32.8	29.4
Bluegrass	3.3	7.5
Northern Cumberland	35.4	15.7
Southern Cumberland	30.7	16.8
Eastern	43.1	11.1
Total	195.7	123.3

SAWTIMBER

Survey unit	*Desirable cut (million board feet)*	*Cut for products 1962 (million board feet)*
Western	59.4	48.9
Western Coalfield	143.1	189.1
Pennyroyal	116.8	132.8
Bluegrass	13.8	29.7
Northern Cumberland	147.4	80.1
Southern Cumberland	117.0	90.8
Eastern	211.3	60.4
Total	808.8	631.8

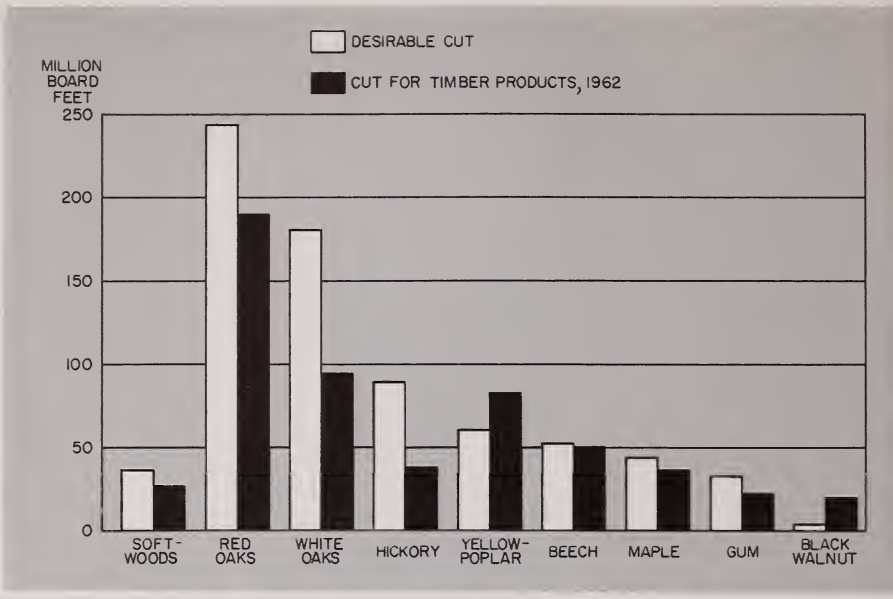


Figure 19.—Comparison of the desirable cut of sawtimber with that actually cut for timber products in 1962 for selected major timber species.

A Word About the Future

We cannot precisely estimate future trends because they depend in large part on human attitudes and behavior, which are changeable. For example, no one can say for certain how consumer tastes for wood products will change or what kinds of new products will be developed. Nor can we predict what shifts will occur in the attitudes of woodland owners toward forest management. However, we do know about present trends and forest conditions, and we can use this information to guide us in a general appraisal of what is to come.

Current data indicate that average stocking is increasing and forest productivity is improving. There are large surpluses of timber for today's needs. In fact, the total rate of timber removal could be increased substantially, and, under normal growth conditions, improvements in productivity and stocking would continue.

The output of products like pulpwood, particle board, and fireplace wood is expected to rise more sharply than that of lumber logs, cooperage bolts, and veneer logs. In fact, a new pulpmill and a new fiberboard plant are in operation and a new pulpmill is under construction. So a greater proportion of future harvests will very likely come from small and low-grade material. This kind of timber is plentiful.

In a total sense then, the outlook for wood supplies in the near future appears favorable even if the harvests are greater. Unfortunately these gross estimates of prospective supplies can mask deficiencies that might occur in certain kinds of timber. Apparently surpluses of small and low-grade material will continue. But we should be concerned about short supplies of high-quality volume for a few important hardwood timber species.

Black walnut deserves particular attention. Black walnut sawtimber now is being cut at a much faster rate than it is growing, and overcutting is greatest in the larger diameter classes where the highest quality material is concentrated. Whether or not severe shortages in this and other quality hardwoods arise will depend primarily on how fast and how much the management and utilization of large timber is improved.

If the desirable cut discussed earlier were actually undertaken, the rate of timber removal from the State would immediately be greater than it is now. But a different kind of timber would be cut. The emphasis would be placed on harvesting older stands of mature and overmature trees before excessive decay and mortality substantially reduced their utility, and on improvement cuttings in younger stands that would develop thrifty crop trees of desirable species.

Most of the effect of the desirable cut would not be realized until after 1972. But even before this date growth would increase and more than offset boosts in the cutting rate. As a result, the timber supply would increase noticeably between 1963 and 1972. Even more important would be the effects on average timber quality and forest stand conditions.

If this cut were made, by 1972 some 500,000 acres of overmature timber would have been removed and another 100,000

acres of forest reaching rotation age each year would have been harvested. Improvement cuttings would have taken place on approximately 175,000 acres each year. Productivity of the forest resource would be greatly enhanced; an improved balance of age classes would be achieved; and Kentucky's forests would be geared to produce a sustained yield of high-quality timber.

■

Appendix

FOREST SURVEY PROCEDURE

The resource statistics in this report were obtained from a timber-management-plan forest inventory of the Daniel Boone National Forest and a survey of all other forest land. Both were sampling surveys designed to yield reliable statistics for large areas. Both combined aerial photo interpretation and field work to minimize costs. Both used electronic data-processing machines.

To attain specific levels of statistical accuracy, triple sampling was used. The proportions of forest and nonforest land were determined from aerial photographs. One-fourth of the forest points were stereoscopically classified by forest type, stand size, stocking, and site. One-twelfth of these points were examined on the ground. The ground classifications provided a check on photo classification and a means of improving estimates.

At each forest ground-check point a plot was established. Trees were classified and measured as a basis for estimating timber volume, growth, mortality, and quality. Ownership was determined for each plot.

Timber-cut information was based on forest-industry production records for 1962, on stump counts at forest-inventory plots, cutting records from large owners, and utilization factors based on a logging-residue study.

ACCURACY OF SURVEY ESTIMATE

Estimates of forest area and timber volume are subject to two kinds of errors: (1) nonsampling errors caused by mistakes in judgment, recording of measurements, or in calculation, and (2) sampling errors inherent in statistical work.

Nonsampling errors are not measurable and cannot be shown. They are avoided as much as possible by training of personnel, close supervision, and careful checking of all phases of the work.

Sampling errors are subject to the laws of chance and may be estimated by statistical methods. These errors are held to acceptable levels commensurate with the values involved and funds available by adjusting the survey design and the intensity of the sample. With a probability of 2 out of 3 (that is, relatively good) the accompanying tabulation shows the accuracy of the data in this report:

The sampling error of a survey is less for a large class or block than for a smaller class. Some of the statistics in this report have such large errors that it would be unwise to use them alone, but if they are combined with other figures the errors may be reduced enough to warrant their use. Weak figures are shown to allow various combinations of data.

Guides for judging accuracy of area and volume

Commercial forest land	Sampling error	Growing-stock volumes	Sampling error	Sawtimber volumes	Sampling error
Acres	*Percent* ±	*Thousand cubic feet*	*Percent* ±	*Thousand board feet*	*Percent* ±
11,712,800	0.9	7,389,700	1.3	26,148,110	1.9
5,000,000	1.3	5,000,000	1.6	20,000,000	2.2
1,000,000	2.9	1,000,000	3.5	10,000,000	3.1
500,000	4.2	500,000	4.9	5,000,000	4.4
100,000	9.3	300,000	6.3	1,000,000	9.8
50,000	13.1	100,000	11.0	500,000	13.8
25,000	18.6	50,000	15.5	100,000	30.9
10,000	29.4	10,000	34.7	50,000	43.6
5,000	41.4	5,000	48.9	10,000	97.6
2,000	65.3				
1,000	91.9				

DEFINITION OF TERMS

Land Use Classes

Land area.—The area of dry land and of land temporarily or partially covered by water such as marshes and swamps; flood plains, streams, and sloughs less than 1/8 mile wide; and lakes, reservoirs, and ponds smaller than 40 acres.

Forest land.—Land now or formerly at least 10 percent stocked by forest trees of any size and not currently developed for nonforest use. Excludes urban or thickly settled residential and resort areas, city parks, orchards, farmsteads, improved roads, or lands developed and maintained for nonforest use. The minimum forest area classified was 1 acre. Roadside, streamside, and shelter-belt strips of timber at least 120 feet wide qualified as forest land. Unimproved roads and trails, streams, and clearings less than 120 feet wide in forest land were also included.

Commercial forest land.—Forest land that does or can produce crops of industrial wood and that is not withdrawn from timber utilization by statute or administrative regulation.

Noncommercial forest land.—Unproductive forest land incapable of yielding crops of industrial wood, and productive public forest land withdrawn from commercial timber use through statute or administrative regulation.

Forest Types

Forest-type classification of forest land is based upon species of all live trees.

Southern pine.—Forests in which 50 percent or more of the stocking is shortleaf or other southern yellow pines, singly or in combination.

Redcedar-hardwoods.—Forests in which 50 percent or more of the stocking is hardwoods but in which redcedar makes up at least 25 percent

of the stocking. Included also are those areas where redcedar makes up most of the stocking.

Oak-pine.—Forests in which 50 percent or more of the stocking is hardwoods (usually upland oaks) but in which southern pine makes up at least 25 percent of the stocking.

White oak.—Forests in which 50 percent or more of the stocking is white oak, except stands that classify as redcedar-hardwoods or oak-pine.

Oak-hickory.—Forests in which 50 percent or more of the stocking is upland oaks or hickories, singly or in combination, except stands that classify as oak-pine, redcedar-hardwoods, or white oak.

Central mixed hardwoods.—Forests in which 50 percent or more of the stocking is a combination of hardwood species, principally yellow-poplar, maple, beech, basswood, black walnut, elm, and northern red oak, except stands that classify as redcedar-hardwoods, oak-pine, oak-hickory, maple-beech, or elm-ash-cottonwood.

Maple-beech.—Forests in which 50 percent or more of the stocking is maple or beech, singly or in combination, except stands that classify as redcedar-hardwoods or oak-pine.

Oak-gum-cypress.—Bottomland forests in which 50 percent or more of the stocking is blackgum, sweetgum, oak, or southern cypress, singly or in combination, except stands that classify as oak-pine.

Elm-ash-cottonwood.—Forests in which 50 percent or more of the stocking is elm, ash, or cottonwood, singly or in combination except stands that classify as redcedar-hardwoods or oak-pine.

Ownership Classes

National Forest.—Federally owned land within National Forest boundaries and other lands under the administration of the U. S. Forest Service.

Other Federal.—Federal lands, other than National Forest, in military reservations, wildlife refuges, and the like.

State.—Lands the State owns or has leased for more than 50 years.

County and municipal.—Lands that counties or municipalities own or have leased for more than 50 years.

Forest industry.—Land owned by companies or individuals operating wood-using plants.

Farmer-owned.—Lands owned by operators of farms, retired farmers, or wives of farmers. A farm must include 10 or more acres and must yield $50 or more annually from agricultural products or, if less than 10 acres, the yield must be at least $250 annually. Forest land owned by a farmer is classified as farmer-owned, whether or not the tract contains an agricultural operation, unless the owner operates a forest industry. Lands leased by farm operators from such owners as railroads, States, and pulp companies are not considered to be farmer-owned.

Miscellaneous private.—Private owned lands other than forest-industry or farmer-owned.

Stand-size Classes

Stand-size class.—A classification of forest land based on the predominant size of timber present; sawtimber, poletimber, or seedlings and saplings.

Sawtimber stands.—Stands that are at least 10 percent stocked with growing-stock trees and have half or more of this stocking in sawtimber or poletimber trees, with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands that are at least 10 percent stocked with growing-stock trees and that have half or more of this stocking in sawtimber and/or poletimber trees, with poletimber stocking exceeding that of sawtimber.

Seedling-sapling stands.—Stands that are at least 10 percent stocked with growing-stock trees and in which seedlings and/or saplings comprise more than half of this stocking.

Nonstocked areas.—Commercial forest lands that are less than 10 percent stocked with growing-stock trees.

Stocking Classes

Stocking class.—A classification of commercial-forest land based on the percent of area occupied by growing-stock trees. Growing-stock trees include all live trees except culls.

Well stocked.—Stands that are 70 percent or more stocked with growing-stock trees.

Medium stocked.—Stands that are 40 to 69 percent stocked with growing-stock trees.

Poorly stocked.—Stands that are from 10 to 39 percent stocked with growing-stock trees.

Nonstocked.—Areas of commercial-forest land not qualifying as sawtimber, poletimber, or seedling-and-sapling stands. These areas may contain some volume but less than 10 percent of the growing space is effectively utilized by growing stock.

Area-Condition Classes

Area-condition.—Classification of commercial-forest land is based upon stocking by desirable growing-stock trees and conditions affecting current and prospective timber growth. Desirable growing-stock trees have no serious defects in quality to limit present or prospective use. They have relatively high vigor and contain no pathogens that may cause death or serious deterioration before rotation age. These trees would be favored in silvicultural operations.

Desirable.—Areas that are 70 percent or more stocked with desirable trees.

Moderate and favorable.—Areas that are 40 to 70 percent stocked with desirable trees and in which 30 percent or less of the area has other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Moderate and unfavorable.—Areas that are 40 to 70 percent stocked with desirable trees and in which more than 30 percent of the area has other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Poor but favorable.—Areas that are less than 40 percent stocked with desirable trees and in which 30 percent or less of the area has other trees and/or inhibiting vegetation or surface conditions that prevent occupancy by desirable trees.

Poor and unfavorable.—Areas that are less than 40 percent stocked with desirable trees and in which more than 30 percent of the area has other trees and/or inhibiting vegetation or surface conditions that prevent occupancy by desirable species.

Site Class

A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

Stand-Age Classifications

Stand-age classifications are determined from the age of the main stand for both even-and uneven-aged stands.

Tree Classifications

Growing-stock trees.—All live sawtimber, poletimber, and sapling and seedling trees. Cull trees are not considered growing stock.

Sawtimber trees.—Live trees of commercial species containing at least an 8-foot sawlog. Softwoods must be at least 9 inches and hardwoods at least 11 inches d.b.h. outside bark.

Poletimber trees.—Live trees of commercial species at least 5 inches d.b.h. but smaller than sawtimber size, and of good form and vigor.

Saplings.—Live trees of commercial species 1 to 5 inches d.b.h. and of good form and vigor.

Seedlings.—Live trees of commercial species less than 1 inch d.b.h. that are expected to survive.

Sound cull trees.—Live trees of sawtimber of poletimber size that are unmerchantable for sawlogs, now or prospectively, because of roughness, poor form, or species.

Rotten cull trees.—Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs, now or prospectively, and with more than 50 percent of the defect due to rot.

Salvable dead trees.—Standing or down dead trees that are currently merchantable.

Diameter Measurements

Diameter at breast height.—The diameter of a tree at 4.5 feet above ground level.

Diameter class.—Trees in a 2-inch diameter range, ranging from 1.0 inch below the midpoint of the class to 0.9 inch above the midpoint. For example, the 6-inch class would include trees from 5.0 to 6.9 inches d.b.h.

Volume Classifications

Cord.—The amount of stacked wood contained in a pile whose dimensions indicate a gross volume of 128 cubic feet; equivalent to 79 cubic feet of solid wood.

Board foot.—A unit of measure for lumber 1 inch thick and 1 foot square.

Volume of sawtimber.—Net volume of the sawlog portion of live sawtimber trees in board feet, International ¼-inch rule.

Volume of growing stock.—Volume of sound wood in the bole of sawtimber and poletimber trees from stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Volume of all timber.—The volume of sound wood in the bole of growing stock, cull, and salvable dead trees 5.0 inches and larger in diameter at breast height, from stump to a minimum 4.0-inch top bark or to the point where the central stem breaks into limbs.

Log Grades

Log grades are a classification of log quality based on external indicators.

Hardwoods were graded according to *Hardwood Log Grades for Standard Lumber* published by the U. S. Forest Products Laboratory in 1953. Hardwood log grades include, in addition to the above, a grade 4 or tie-and-timber grade. A tie-and-timber log had to be sound internally, with no single knot or group of knots within any 6-inch section exceeding one-third the log diameter at that point. Rotten defects or holes could not extend more than 3 inches into the potential tie or timber. Sweep could not exceed one-fourth the scaling diameter in any 8 feet of length.

Softwoods other than eastern white pine and redcedar were graded according to the U. S. Forest Service's *1953 Interim Log Grades for Southern Pine* using the specifications for 4-face grading. Eastern white pine was graded according to revised *Trial Log Grades for Eastern White Pine* prepared by the U. S. Forest Service in 1960. Merchantable redcedar logs were assigned grade 1. To be considered merchantable, redcedar logs had to be sound of heart, with sweep not exceeding two-thirds of the small end diameter.

Growth

Net annual growth.—The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth less volume losses resulting from natural causes.

Growing-stock growth.—Net annual growth of poletimber and sawtimber trees in cubic feet.

Sawtimber growth.—Net annual growth of sawtimber trees in board feet, International ¼-inch rule.

Mortality

Mortality of growing stock.—Cubic-foot volume of sound wood in sawtimber and poletimber trees that died from natural causes.

Mortality of sawtimber.—Net board-foot volume of sawtimber trees that died from natural causes.

Timber Cut

Timber cut from growing stock.—The net cubic-foot volume of sound wood in live sawtimber and poletimber trees cut for forest products in a specified year, including both roundwood products and logging residues.

Timber cut from sawtimber.—The net board-foot volume of live sawtimber trees cut for forest products in a specified year, including both roundwood products and logging residues.

Timber products output.—The volume of rough forest products cut from growing stock, cull and dead trees, limbwood, and plant by products.

Logging residue.—The net volume of live sawtimber and poletimber trees cut or killed by commercial logging operations on commercial forest land and not converted to timber products.

Desirable Cut

Desirable cut (formerly called allowable cut).—The net volume of live sawtimber and poletimber trees that can be cut annually during the next 10 years in commercial logging operations while growing stock is maintained or increased and age classes below the rotation age selected for each type are distributed evenly. It includes harvest and improvement cuts yielding 3 cords or more per acre, and one-tenth of the entire net volume of stands 10 or more years beyond the rotation age. Rotation ages for sawlog trees in extensively managed stands by forest type and site-index classes are shown below:

Forest type	*Site index (50-year height in feet)**						
	40	50	60	70	80	90	100+
Southern pine	120	110	90	—	—	—	—
Redcedar-hardwoods	120	110	90	—	—	—	—
Oak-pine	120	110	90	—	—	—	—
White oak	120	110	90	80	75	70	—
Oak-hickory	120	110	90	80	75	70	—
Central mixed hardwoods	—	110	90	80	75	70	60
Maple-beech	—	100	100	100	100	—	—
Oak-gum-cypress	—	—	—	80	75	70	60
Elm-ash-cottonwood**	—	—	—	80	70	60	60

*Except in the case of cottonwood for which it is total height at 25 years.
**The rotation for cottonwood is half of the age shown.

Desirable cut includes all timber of merchantable size that should be cut from commercial-forest land to salvage, rejuvenate, or improve the stands and increase the growth without regard to restraints of ownership, inaccessibility, or profit.

PRINCIPAL COMMERCIAL TREE SPECIES OF KENTUCKY[4]

Softwoods

Cypress (baldcypress)	*Taxodium distichum* (L) Rich.
Hemlock (eastern)	*Tsuga canadensis* (L.) Carr.
Pine group includes—	
Shortleaf pine	*Pinus echinata* Mill.
Other yellow pines:	
Pitch pine	*P. rigida* Mill.
Virginia pine	*P. virginiana* Mill.
White pine (eastern)	*P. strobus* L.
Redcedar (eastern)	*Juniperus virginiana* L.

Hardwoods

Ash	*Fraxinus* L. species.
Basswood	*Tilia* L. species
Beech (American)	*Fagus grandifolia* Ehrh.
Birch (Yellow)	*Betula alleghaniensis* Britton
Blackgum	*Nyssa* L. Species
Black walnut	*Juglans nigra* L.
Cottonwood (eastern)	*Populus deltoides* Bartr.
Hickory	*Carya* Nutt. species
Maple (hard) includes—	
Black maple	*Acer nigrum* Michx. f.
Sugar maple	*A. saccharum* Marsh.
Maple (soft) includes—	
Boxelder	*A. negundo* L.
Red maple	*A. rubrum* var. *rubrum* L.
Silver maple	*A. saccharinum* L.
Oak group includes—	
Select red oaks:	
Cherrybark oak	*Quercus falcata* var. *pagodaefolia* Ell.
Northern red oak	*Q. rubra* L.
Shumard oak	*Q. shumardii* Buckl.
Other red oaks:	
Black oak	*Q. velutina* Lam.
Pin oak	*Q. palustris* Muenchh.
Scarlet oak	*Q. coccinea* Muenchh.
Shingle oak	*Q. imbricaria* Michx.
Southern red oak	*Q. falcata* Michx.
Water oak	*Q. nigra* L.
Willow oak	*Q. phellos* L.

[4] The common and scientific names are based on: Little, Elbert L., Jr. CHECK LIST OF NATIVE AND NATURALIZED TREES OF THE UNITED STATES (INCLUDING ALASKA). U. S. Dep. Agr., Agr. Handbook 41, 472 pp. 1953.

Select white oaks:	
Bur oak	*Q. macrocarpa* Michx.
Chinkapin oak	*Q. muehlenbergii* Engelm.
Swamp chestnut oak	*Q. michauxii* Nutt.
Swamp white oak	*Q. bicolor* Willd.
White oak	*Q. alba* L.
Other white oaks:	
Chestnut oak	*Q. prinus* L.
Overcup oak	*Q. lyrata* Walt.
Post oak	*Q. stellata* var. *stellata* Wangenh.
Sweetgum	*Liquidambar styraciflua* L.
Yellow-poplar	*Liriodendron tulipifera* L.
Other hardwoods:	
Birch(river)	*Betula nigra* L.
Buckeye (Ohio)	*Aesculus glabra* Willd.
Buckeye (yellow)	*A. octandra* Marsh.
Butternut	*Juglans cinerea* L.
Cherry (black)	*Prunus serotina* Ehrh.
Coffeetree (Kentucky)	*Gymnocladus dioicus* (L.) K. Koch
Cucumbertree	*Magnolia acuminata* L.
Dogwood (flowering)	*Cornus florida* L.
Elm	*Ulmus* L. species
Hackberry	*Celtis occidentalis* L.
Honeylocust	*Gleditsia triacanthos* L.
Locust (black)	*Robinia pseudoacacia* L.
Mulberry (red)	*Morus rubra* L.
Osage-orange	*Maclura pomifera* (Raf.) Schneid.
Persimmon (common)	*Diospyros virginiana* L.
Sassafras	*Sassafras albidum* (Nutt.) Nees
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Table 1.—*Land area by classes and forest survey units, Kentucky, 1963*

(In acres)

Land class	All units	Western	Western Coalfield	Pennyroyal	Bluegrass	Northern Cumberland	Southern Cumberland	Eastern
Forest land:								
Commercial forest	11,712,800	721,300	1,842,700	2,166,800	1,128,000	1,857,800	2,200,700	1,795,500
Unproductive forest	61,700	—	12,600	15,200	6,300	5,400	3,900	18,300
Productive-reserved forest	80,700	1,900	43,300	7,400	1,200	6,200	16,000	4,700
Total forest land	11,855,200	723,200	1,898,600	2,189,400	1,135,500	1,869,400	2,220,600	1,818,500
Nonforest land:								
Cropland	5,186,800	628,700	1,729,000	1,082,400	1,167,800	256,700	261,000	61,200
Pasture and range	6,368,700	469,500	1,208,800	1,212,200	2,792,600	361,500	257,200	66,900
Other	2,101,600	374,400	655,400	287,900	552,700	6,500	35,600	189,100
Total nonforest land[1]	13,657,100	1,472,600	3,593,200	2,582,500	4,513,100	624,700	553,800	317,200
All land[2]	25,512,300	2,195,800	5,491,800	4,771,900	5,648,600	2,494,100	2,774,400	2,135,700

[1] Includes 44,000 acres of water according to survey standards of area classification but defined by Bureau of the Census as land.
[2] From U. S. Bureau of the Census, Land and Water Area of the United States, 1960.

Table 2.—*Area of commercial forest land, by ownership classes and forest survey units, Kentucky, 1963*

(In acres)

Ownership class	All units	Western	Western Coalfield	Pennyroyal	Bluegrass	Northern Cumberland	Southern Cumberland	Eastern
National Forest	452,800	—	—	23,800	13,800	109,200	306,000	—
Other Federal	207,300	79,400	5,500	109,800	—	—	—	12,600
State	76,800	5,800	17,600	4,000	1,300	800	19,400	27,900
County and municipal	5,200	—	—	—	5,200	—	—	—
Forest industry	227,900	18,500	8,200	31,900	16,900	5,200	61,400	85,800
Farmer-owned	7,663,900	506,100	1,329,900	1,603,600	909,400	1,246,300	1,454,800	613,800
Miscellaneous private	3,078,900	111,500	481,500	393,700	181,400	496,300	359,100	1,055,400
All ownerships	11,712,800	721,300	1,842,700	2,166,800	1,128,000	1,857,800	2,200,700	1,795,500

Table 3.—*Area of commercial forest land by stand-size, and ownership classes, and survey units, Kentucky, 1963*

(In acres)

Stand-size class	All ownerships	National forest	Other public	Forest industry	Farmer and miscellaneous private
WESTERN UNIT					
Sawtimber	439,000	—	66,200	18,500	354,300
Poletimber	123,000	—	5,300	—	117,700
Sapling-and-seedling	159,300	—	13,700	—	145,600
Nonstocked	—	—	—	—	—
All classes	721,300	—	85,200	18,500	617,600
WESTERN COALFIELD UNIT					
Sawtimber	864,800	—	10,800	3,800	850,200
Poletimber	444,600	—	5,600	2,000	437,000
Sapling-and-seedling	503,500	—	6,300	2,200	495,000
Nonstocked	29,800	—	400	200	29,200
All classes	1,842,700	—	23,100	8,200	1,811,400
PENNYROYAL UNIT					
Sawtimber	964,500	20,300	71,700	13,700	858,800
Poletimber	549,900	3,300	13,300	8,400	524,900
Sapling-and-seedling	641,800	200	24,500	9,700	607,400
Nonstocked	10,600	—	4,300	100	6,200
All classes	2,166,800	23,800	113,800	31,900	1,997,300
BLUEGRASS UNIT					
Sawtimber	247,300	12,600	—	16,900	217,800
Poletimber	384,500	800	2,000	—	381,700
Sapling-and-seedling	481,100	200	4,500	—	476,400
Nonstocked	15,100	200	—	—	14,900
All classes	1,128,000	13,800	6,500	16,900	1,090,800
NORTHERN CUMBERLAND UNIT					
Sawtimber	847,500	84,600	400	5,200	757,300
Poletimber	503,900	23,100	200	—	480,600
Sapling-and-seedling	505,500	600	200	—	504,700
Nonstocked	900	900	—	—	—
All classes	1,857,800	109,200	800	5,200	1,742,600

Continued

Table 3. — *Continued*

Stand-size class	All ownerships	National forest	Other public	Forest industry	Farmer and miscellaneous private
			SOUTHERN CUMBERLAND UNIT		
Sawtimber	1,141,600	246,300	8,200	11,600	875,500
Poletimber	508,700	53,300	9,600	27,900	417,900
Sapling-and-seedling	534,400	2,500	900	21,900	509,100
Nonstocked	16,000	3,900	700	—	11,400
All classes	2,200,700	306,000	19,400	61,400	1,813,900
			EASTERN UNIT		
Sawtimber	1,074,800	—	16,400	78,400	980,000
Poletimber	256,800	—	17,100	—	239,700
Sapling-and-seedling	459,300	—	5,800	7,400	446,100
Nonstocked	4,600	—	1,200	—	3,400
All classes	1,795,500	—	40,500	85,800	1,669,200
			ALL UNITS		
Sawtimber	5,579,500	363,800	173,700	148,100	4,893,900
Poletimber	2,771,400	80,500	53,100	38,300	2,599,500
Sapling-and-seedling	3,284,900	3,500	55,900	41,200	3,184,300
Nonstocked	77,000	5,000	6,600	300	65,100
All classes	11,712,800	452,800	289,300	227,900	10,742,800

Table 4.—*Area of commercial forest land by forest type and forest survey units, Kentucky, 1963*
(In acres)

Forest type	All units	Western	Western Coalfield	Pennyroyal	Bluegrass	Northern Cumberland	Southern Cumberland	Eastern
Southern pine	367,700	—	16,700	58,200	30,100	99,500	132,800	30,400
Redcedar-hardwoods	548,000	—	116,300	190,300	223,700	—	12,900	4,800
Oak-pine	557,400	6,500	15,700	48,000	22,700	151,200	275,000	38,300
White oak	281,000	9,200	49,000	66,200	12,300	89,400	41,500	13,400
Oak-hickory	4,748,500	298,900	724,100	879,500	283,000	917,900	870,100	775,000
Central mixed hardwoods	4,025,300	180,700	579,100	783,400	361,400	534,200	764,500	822,000
Maple-beech	304,200	—	46,000	45,200	16,000	43,500	49,200	104,300
Oak-gum-cypress	130,100	60,500	69,600	—	—	—	—	—
Elm-ash-cottonwood	750,600	165,500	226,200	96,000	178,800	22,100	54,700	7,300
All types	11,712,800	721,300	1,842,700	2,166,800	1,128,000	1,857,800	2,200,700	1,795,500

Table 5.—*Area of commercial forest land, by sawtimber volume and stand-size classes, Kentucky, 1963*

(In acres)

Volume per acre (board feet)[1]	All stands	Sawtimber stands	Other stands
Less than 1,500 board feet	5,672,700	504,700	5,168,000
1,500 to 5,000 board feet	4,684,900	3,724,200	960,700
More than 5,000 board feet	1,355,200	1,350,600	4,600
All classes	11,712,800	5,579,500	6,133,300

[1]Net volume, International ¼-inch rule.

Table 6.—*Area of commercial forest land, by stocking classes based on alternative stand components, Kentucky, 1963*

(In acres)

Stocking class (percent)	Stocking classified in terms of:		
	All trees	Growing-stock trees	Desirable trees
90 to 100	6,886,900	723,600	9,000
80 to 90	1,694,500	1,479,700	44,000
70 to 80	1,149,200	2,281,000	141,500
60 to 70	810,000	2,402,000	448,500
50 to 60	524,700	2,075,800	915,800
40 to 50	312,600	1,357,500	1,631,500
30 to 40	134,500	717,500	2,318,500
20 to 30	94,600	402,300	2,517,400
10 to 20	59,900	196,400	2,344,900
Less than 10	45,900	77,000	1,341,700
All areas	11,712,800	11,712,800	11,712,800

Table 7.—*Area of commercial forest land, by stocking classes of growing-stock trees and by stand-size classes, Kentucky, 1963*

(In acres)

Stocking class (percent)	All stands	Sawtimber stands	Poletimber stands	Sapling-and-seedling stands	Nonstocked stands
70 or more	4,484,300	2,601,000	1,019,300	864,000	—
40 to 70	5,835,300	2,654,400	1,488,700	1,692,200	—
10 to 40	1,316,200	324,100	263,400	728,700	—
Less than 10	77,000	—	—	—	77,000
All classes	11,712,800	5,579,500	2,771,400	3,284,900	77,000

Table 8.—*Area of commercial forest land, by area-condition and ownership classes, Kentucky, 1963*

(In acres)

Area-condition class	All ownerships	National forest	Other public	Forest industry	Farmer and miscellaneous private
Desirable	194,500	56,800	13,400	3,800	120,500
Moderate and favorable	1,448,200	14,000	25,700	28,600	1,379,900
Moderate and unfavorable	1,547,800	168,000	37,300	5,100	1,337,400
Poor but favorable	1,194,500	23,200	21,600	4,900	1,144,800
Poor and unfavorable	7,327,800	190,800	191,300	185,500	6,760,200
All classes	11,712,800	452,800	289,300	227,900	10,742,800

Table 9.—*Area of commercial forest land by sites and ownership classes, Kentucky, 1963*

(In acres)

Site class[1]	All ownerships	National forest	Other public	Forest industry	Farmer and miscellaneous private
120 or more	484,600	36,800	18,100	25,500	404,200
85 to 120	5,655,100	55,100	119,300	99,900	5,380,800
50 to 85	4,731,300	353,700	113,300	63,500	4,200,800
Less than 50	841,800	7,200	38,600	39,000	757,000
All classes	11,712,800	452,800	289,300	227,900	10,742,800

[1] Potential growth per acre per year in cubic feet.

Table 10.—*Area of commercial forest land, by forest types and ownership classes, Kentucky, 1963*

(In acres)

Forest type	All ownerships	Public ownerships	Private ownerships
Southern pine	367,700	41,500	326,200
Redcedar-hardwoods	548,000	18,200	529,800
Oak-pine	557,400	113,900	443,500
White oak	281,000	18,200	262,800
Oak-hickory	4,748,500	310,000	4,438,500
Central mixed hardwoods	4,025,300	199,100	3,826,200
Maple-beech	304,200	12,700	291,500
Oak-gum-cypress	130,100	2,900	127,200
Elm-ash-cottonwood	750,600	25,600	725,000
All types	11,712,800	742,100	10,970,700

Table 11.—*Area of commercial forest land by forest types and site classes, Kentucky, 1963*

(In acres)

Forest type	All sites	Site class[1]			
		120 or more	85 to 120	50 to 85	Less than 50
Southern pine	367,700	11,900	122,100	206,200	27,500
Redcedar-hardwoods	548,000	—	417,400	130,600	—
Oak-pine	557,400	50,200	215,900	246,400	44,900
White oak	281,000	1,500	187,800	87,000	4,700
Oak-hickory	4,748,500	261,100	2,700,000	1,736,300	51,100
Central mixed hardwoods	4,025,300	126,000	1,538,500	1,760,900	599,900
Maple-beech	304,200	12,100	148,200	100,300	43,600
Oak-gum-cypress	130,100	—	66,000	64,100	—
Elm-ash-cottonwood	750,600	21,800	259,200	399,500	70,100
All types	11,712,800	484,600	5,655,100	4,731,300	841,800

[1] Potential growth per acre per year in cubic feet.

Table 12.—*Area of commercial forest land by forest types and stand-age classes, Kentucky, 1963*

(In acres)

Forest type	All ages	Age class (years)								
		Less than 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 79	80 to 99	100+
Southern pine	367,700	31,900	69,600	74,700	63,500	64,700	31,800	16,100	11,200	4,200
Redcedar-hardwoods	548,000	51,800	93,300	148,200	112,500	65,900	43,800	22,600	9,900	—
Oak-pine	557,400	16,700	55,900	117,800	116,700	74,500	66,500	80,000	24,500	4,800
White oak	281,000	100	13,000	30,400	45,300	35,400	65,100	66,500	10,100	15,100
Oak-hickory	4,748,500	56,300	257,400	526,100	791,500	813,700	787,100	767,700	529,900	218,800
Central mixed hardwoods	4,025,300	174,300	664,500	929,000	824,400	518,800	344,600	267,500	173,300	128,900
Maple-beech	304,200	9,300	11,300	11,400	31,700	65,500	42,300	44,100	45,800	42,800
Oak-gum-cypress	130,100	—	12,000	7,000	18,000	29,200	18,900	35,500	9,500	—
Elm-ash-cottonwood	750,600	24,400	87,700	152,600	163,200	176,700	82,300	31,900	27,300	4,500
All types	11,712,800	364,800	1,264,700	1,997,200	2,166,800	1,844,400	1,482,400	1,331,900	841,500	419,100

Table 13.—*Area of noncommercial forest land, by forest types, Kentucky, 1963*

Forest type	All areas	Productive-reserved areas	Unproductive areas
Southern pine	1,700	1,700	—
Redcedar-hardwoods	12,000	—	12,000
Oak-pine	20,900	20,900	—
Oak-hickory	92,500	46,400	46,100
Central mixed hardwoods	11,600	11,600	—
Elm-ash-cottonwood	3,700	100	3,600
All types	142,400	80,700	61,700

Table 14.—*Area of commercial forest land by forest types and area-condition classes, Kentucky, 1963*

(In acres)

Forest type	All area conditions	Desirable	Moderate and favorable	Moderate and unfavorable	Poor but favorable	Poor and unfavorable
Southern pine	367,700	20,400	61,200	75,400	50,400	160,300
Redcedar-hardwoods	548,000	4,400	121,100	53,400	95,400	273,700
Oak-pine	557,400	17,800	47,000	95,100	53,500	344,000
White-oak	281,000	5,500	81,800	23,900	29,200	140,600
Oak-hickory	4,748,500	79,800	706,500	680,400	353,100	2,928,700
Central mixed hardwoods	4,025,300	50,500	359,500	508,800	485,600	2,620,900
Maple-beech	304,200	—	—	24,800	16,100	263,300
Oak-gum-cypress	130,100	—	16,900	9,900	26,800	76,500
Elm-ash-cottonwood	750,600	16,100	54,200	76,100	84,400	519,800
All types	11,712,800	194,500	1,448,200	1,547,800	1,194,500	7,327,800

Table 15.—*Area of land and forest land, by counties, Kentucky, 1963*

WESTERN UNIT

County	All land[1]	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Ballard	165,800	47,300	—	47,300	28.5
Calloway	243,800	77,100	—	77,100	31.6
Carlisle	125,400	42,400	—	42,400	33.8
Fulton	131,200	32,300	—	32,300	24.6
Graves	358,400	80,200	—	80,200	22.4
Hickman	158,700	38,000	100	37,900	23.9
Livingston	202,900	73,300	—	73,300	36.1
Lyon	162,600	80,600	—	80,600	49.6
McCracken	160,600	37,600	—	37,600	23.4
Marshall	193,900	66,100	1,800	64,300	33.2
Trigg	292,500	148,300	—	148,300	50.7
All counties	2,195,800	723,200	1,900	721,300	32.8

WESTERN COALFIELD UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Allen	233,000	83,800	300	83,500	35.8
Barren	311,000	83,600	2,200	81,400	26.2
Butler	283,500	135,500	600	134,900	47.6
Caldwell	228,500	79,200	300	78,900	34.5
Christian	464,600	131,400	1,800	129,600	27.9
Crittenden	233,600	87,800	600	87,200	37.3
Daviess	298,200	70,300	300	70,000	23.5
[illegible]	[illegible]	[illegible]	[illegible]	73,200	39.0

Daviess	298,200	70,200	200	70,000	23.5
Edmonson	194,600	117,100	41,200	75,900	39.0
Henderson	281,600	61,300	500	60,800	21.6
Hopkins	355,200	168,700	3,100	165,600	46.6
Logan	360,300	109,700	400	109,300	30.3
McLean	164,500	45,500	100	45,400	27.6
Monroe	213,800	99,000	600	98,400	46.0
Muhlenberg	308,500	140,900	900	140,000	45.4
Ohio	381,400	195,800	1,000	194,800	51.1
Simpson	153,000	23,300	100	23,200	15.2
Todd	240,600	61,700	600	61,100	25.4
Union	219,500	45,700	100	45,600	20.8
Warren	349,400	90,600	400	90,200	25.8
Webster	217,000	67,800	900	66,900	30.8
All counties	5,491,800	1,898,600	55,900	1,842,700	33.6

PENNYROYAL UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Adair	251,500	108,800	800	108,000	42.9
Breckenridge	362,300	160,000	1,400	158,600	43.8
Bullitt	192,000	106,600	600	106,000	55.2
Casey	278,400	153,800	1,100	152,700	54.8
Clinton	122,200	64,400	500	63,900	52.3
Cumberland	196,500	119,800	1,100	118,700	60.4
Grayson	329,000	122,500	500	122,000	37.1
Green	180,500	60,200	500	59,700	33.1
Hancock	119,700	56,800	500	56,300	47.0
Hardin	394,200	150,300	1,000	149,300	37.9

Continued

Table 15. — *Continued*

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Hart	272,000	122,900	5,600	117,300	43.1
Larue	166,400	55,700	400	55,300	33.2
Marion	219,500	82,800	600	82,200	37.4
Meade	197,100	81,000	500	80,500	40.8
Metcalfe	189,400	88,000	500	87,500	46.2
Nelson	279,700	117,200	900	116,300	41.6
Pulaski	403,200	211,200	1,400	209,800	52.0
Russell	154,900	76,300	2,700	73,600	47.5
Taylor	181,800	71,800	600	71,200	39.2
Wayne	281,600	179,300	1,400	177,900	63.2
All counties	4,771,900	2,189,400	22,600	2,166,800	45.4

BLUEGRASS UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Anderson	131,800	34,100	100	34,000	25.8
Bath	183,700	56,500	200	56,300	30.6
Boone	161,300	44,400	100	44,300	27.5
Bourbon	192,000	5,100	—	5,100	2.7
Boyle	116,500	20,100	—	20,100	17.3
Bracken	131,800	39,600	300	39,300	29.8
Campbell	96,600	23,800	100	23,700	24.5

Carroll	83,800	26,600	500	26,100	31.1
Clark	165,800	12,200	200	12,000	7.2
Fayette	179,200	5,500	—	5,500	3.1
Fleming	224,000	60,300	200	60,100	26.8
Franklin	135,000	44,700	400	44,300	32.8
Gallatin	64,000	19,600	100	19,500	30.5
Garrard	151,000	23,800	—	23,800	15.8
Grant	160,000	38,400	300	38,100	23.8
Harrison	197,100	33,500	100	33,400	16.9
Henry	185,000	44,800	600	44,200	23.9
Jefferson	240,000	33,500	100	33,400	13.9
Jessamine	113,300	12,200	100	12,100	10.7
Kenton	105,600	28,200	500	27,700	26.2
Lincoln	217,600	58,700	500	58,200	26.7
Madison	285,400	49,200	200	49,000	17.2
Mason	153,000	18,500	—	18,500	12.1
Mercer	163,800	17,600	100	17,500	10.7
Montgomery	130,600	18,700	200	18,500	14.2
Nicholas	130,600	23,900	100	23,800	18.2
Oldham	117,800	22,200	200	22,000	18.7
Owen	224,600	81,000	500	80,500	35.8
Pendleton	178,600	50,500	600	49,900	27.9
Robertson	64,600	16,300	100	16,200	25.1
Scott	181,800	25,600	200	25,400	14.0
Shelby	245,800	31,400	100	31,300	12.7
Spencer	123,500	24,600	100	24,500	19.8
Trimble	93,400	34,600	300	34,300	36.7
Washington	196,500	47,100	300	46,800	23.8
Woodford	123,500	8,700	100	8,600	7.0
All counties	5,648,600	1,135,500	7,500	1,128,000	20.0

Continued

Table 15. — *Continued*

NORTHERN CUMBERLAND UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Boyd	101,700	57,200	100	57,100	56.1
Carter	257,300	181,900	1,100	180,800	70.3
Elliott	153,600	114,100	100	114,000	74.2
Greenup	224,000	158,000	3,100	154,900	69.2
Johnson	169,000	136,900	200	136,700	80.9
Lawrence	272,000	222,800	900	221,900	81.6
Lewis	310,400	226,200	300	225,900	72.8
Magoffin	193,900	161,000	1,600	159,400	82.2
Menifee	134,400	109,400	300	109,100	81.2
Morgan	236,200	171,100	900	170,200	72.1
Powell	110,700	82,200	1,500	80,700	72.9
Rowan	185,600	141,800	1,000	140,800	75.9
Wolfe	145,300	106,800	500	106,300	73.2
All counties	2,494,100	1,869,400	11,600	1,857,800	74.5

SOUTHERN CUMBERLAND UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Bell	236,800	211,500	12,600	198,900	84.0
Breathitt	316,200	281,900	900	281,000	88.9
Clay	303,400	247,600	400	247,200	81.5
Estill	166,400	125,700	300	125,400	75.4
Jackson	215,700	161,700	500	161,300	74.7
[illegible]	[illegible]	177,700	100	177,600	74.4

Jackson	215,700	161,700	500	161,200	74.7
Knox	238,700	177,700	100	177,600	74.4
Laurel	283,500	189,000	1,200	187,800	66.2
Lee	134,400	109,200	200	109,000	81.1
McCreary	261,100	249,800	1,600	248,200	95.1
Owsley	126,100	96,900	100	96,800	76.8
Rockcastle	199,000	140,500	1,100	139,400	70.1
Whitley	293,100	229,100	900	228,200	77.9
All counties	2,774,400	2,220,600	19,900	2,200,700	79.3

EASTERN UNIT

County	All land	Forest land			Commercial forest as a percent of land area
		All forest	Non-commercial	Commercial	
	Acres	*Acres*	*Acres*	*Acres*	*Percent*
Floyd	256,700	193,600	2,100	191,500	74.6
Harlan	300,200	260,600	4,900	255,700	85.2
Knott	227,800	197,600	2,600	195,000	85.6
Leslie	263,700	229,500	2,000	227,500	86.3
Letcher	217,000	185,000	2,800	182,200	84.0
Martin	147,800	130,100	1,700	128,400	86.9
Perry	219,500	187,200	1,000	186,200	84.8
Pike	503,000	434,900	5,900	429,000	85.3
All counties	2,135,700	1,818,500	23,000	1,795,500	84.1

ALL UNITS

All counties	25,512,300	11,855,200	142,400	11,712,800	45.9

[1] From U. S. Bureau of the Census, Land and Water Area of the U. S., 1960.

Table 16.—*Number of growing-stock trees on commercial forest land by diameter class and species group, Kentucky, 1963*

(In thousand trees)

Diameter class (inches at breast height)	All species	Softwoods	Hardwoods
2	1,992,180	180,990	1,811,190
4	796,800	97,230	699,570
6	376,080	40,720	335,360
8	216,220	23,400	192,820
10	139,180	12,830	126,350
12	86,670	6,370	80,300
14	50,280	3,080	47,200
16	27,800	1,280	26,520
18	14,680	460	14,220
20	7,250	170	7,080
22	4,060	90	3,970
24+	5,530	130	5,400
All diameter classes	3,716,730	366,750	3,349,980

Table 17.—*Number of cull and salvable dead trees on commercial forest land, by species and diameter classes, Kentucky, 1963*

(In thousand trees)

Diameter class (inches)	Cull trees	Salvable dead trees
Softwoods:		
5.0 to 8.9	3,780	100
9.0 to 18.9	1,020	20
19.0 and larger	40	[1]
Total	4,840	120
Hardwoods:		
5.0 to 10.9	120,260	1,480
11.0 to 18.9	21,060	490
19.0 and larger	5,440	70
Total	146,760	2,040
All species	151,600	2,160

[1] Less than 500 trees.

Table 18.—*Volume of timber on commercial forest land, by tree and species classes, Kentucky, 1963*

(In thousand cubic feet)

Tree class	All species	Softwoods	Hardwoods
Growing stock:			
Sawtimber			
Sawlog portion	3,746,750	331,290	3,415,460
Upper stem portion	838,230	37,860	800,370
Total sawtimber	4,584,980	369,150	4,215,830
Poletimber	2,804,720	185,520	2,619,200
Total growing stock	7,389,700	554,670	6,835,030
Sound cull:			
Sawtimber	77,980	10,830	67,150
Poletimber	93,000	4,960	88,040
Total sound cull	170,980	15,790	155,190
Rotten cull:			
Sawtimber	52,150	1,300	50,850
Poletimber	29,970	430	29,540
Total rotten cull	82,120	1,730	80,390
Salvable dead:			
Sawtimber	15,190	880	14,310
Poletimber	5,490	—	5,490
Total salvable dead	20,680	880	19,800
All classes[1]	7,663,480	573,070	7,090,410

[1] Estimates of additional volume on unproductive forest land total 6,590 thousand cubic feet in trees, 5.0 inches and larger d.b.h., including 2,400 thousand cubic feet of softwoods and 4,190 thousand cubic feet of hardwoods.

Table 19.—*Volume of growing stock and sawtimber on commercial forest land, by ownership and species classes, Kentucky, 1963*

Ownership class	All species	Softwoods	Hardwoods
	GROWING STOCK (In thousand cubic feet)		
National forest	523,230	156,650	366,580
Other public	281,700	70,410	211,290
Forest industry	211,130	11,350	199,780
Farmer and miscellaneous private	6,373,640	316,260	6,057,380
All ownerships	7,389,700	554,670	6,835,030
	SAWTIMBER (In thousand board feet)[1]		
National forest	1,290,390	450,650	839,740
Other public	905,380	18,120	887,260
Forest industry	900,330	52,490	847,840
Farmer and miscellaneous private	23,052,010	1,244,620	21,807,390
All ownerships	26,148,110	1,765,880	24,382,230

[1] Internation ¼-inch rule.

Table 20.—*Volume of growing stock and sawtimber on commercial forest land, by stand-size and species classes, Kentucky, 1963*

Stand-size class	All species	Softwood	Hardwoods
	GROWING STOCK (In thousand cubic feet)		
Sawtimber	5,217,490	365,600	4,851,890
Poletimber	1,625,880	133,580	1,492,300
Sapling-and-seedling	544,920	54,870	490,050
Nonstocked	1,410	620	790
All classes	7,389,700	554,670	6,835,030
	SAWTIMBER (In thousand board feet)[1]		
Sawtimber	21,789,940	1,347,560	20,442,380
Poletimber	2,917,170	267,620	2,649,550
Sapling-and-seedling	1,438,330	149,090	1,289,240
Nonstocked	2,670	1,610	1,060
All classes	26,148,110	1,765,880	24,382,230

[1] International ¼-inch rule.

Table 21.—*Volume of growing-stock trees on commercial forest land by species and diameter classes, Kentucky, 1963*
(In thousand cubic feet)

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0 and larger
Softwoods:											
Shortleaf pine	208,660	18,860	35,990	41,940	42,840	35,220	19,360	9,100	2,810	2,340	200
Other yellow pines	228,200	36,930	49,220	53,490	39,340	27,660	14,070	5,210	1,400	700	180
White pine	9,340	780	1,410	2,460	560	460	770	1,070	900	380	550
Hemlock	42,050	3,560	5,270	3,990	4,850	2,820	3,380	3,970	3,500	3,130	7,580
Redcedar	57,350	16,030	17,010	11,540	5,700	3,300	2,940	640	190	—	—
Cypress	7,730	—	—	—	—	820	530	1,130	—	—	5,250
Other	1,340	460	—	—	—	410	—	—	—	470	—
Total softwoods	554,670	76,620	108,900	113,420	93,290	70,690	41,050	21,120	8,800	7,020	13,760
Hardwoods:											
Select white oak	999,490[1]	96,030	138,810	192,500	187,630	146,290	94,050	58,970	35,060	17,620	32,530
Select red oak	349,390[2]	16,370	31,950	39,240	47,830	45,750	41,600	37,250	23,240	19,310	46,850
Other white oak	635,710[3]	48,720	71,970	106,320	103,360	91,710	64,990	44,700	20,110	22,130	61,700
Other red oak	1,382,080[4]	82,790	134,610	189,360	209,860	224,850	188,440	128,020	81,200	51,680	91,270
Hickories	953,970	119,910	164,970	170,450	163,940	116,490	82,570	52,110	30,270	20,350	32,910
Yellow birch	2,090	160	—	660	10	290	390	40	540	—	—
Hard maple	189,230	24,010	34,330	36,660	26,210	23,490	13,530	8,300	6,110	4,760	11,830
Beech	306,040	9,280	17,920	30,530	31,890	35,110	34,100	37,820	23,400	22,720	63,270
Black walnut	66,750	9,080	11,650	11,780	12,260	9,380	7,710	2,800	1,310	760	20
Ash	192,810	24,860	37,020	35,710	31,650	21,240	14,430	6,990	5,360	4,510	11,040
Soft maple	227,290	30,110	35,430	35,730	29,350	27,770	20,420	12,980	10,920	9,530	15,050
Sweetgum	163,880	9,790	21,670	28,920	27,440	23,030	22,860	13,130	6,500	4,150	6,390
Blackgum	134,420	12,860	14,070	21,590	20,010	16,220	22,180	10,750	8,430	3,980	4,330
Cottonwood	48,430	400	300	1,500	1,160	2,970	5,770	7,830	7,350	6,900	14,250
Yellow-poplar	631,300	66,080	86,210	92,160	108,180	82,620	68,090	52,250	29,370	18,540	27,800
Basswood	55,410	3,020	3,250	6,760	7,330	9,630	7,800	2,020	9,370	1,270	4,960
Other	496,740[5]	87,510	91,890	82,300	69,450	47,960	37,540	28,850	20,690	12,080	18,470
Total hardwoods	6,835,030	640,980	896,050	1,082,170	1,077,560	924,800	726,470	504,810	319,230	220,290	442,670
All species	7,389,700	717,600	1,004,950	1,195,590	1,170,850	995,490	767,520	525,930	328,030	227,310	456,430

[1] Approximately nine-tenths of this volume is white oak *(Q. alba)*.
[2] Approximately nine-tenths of this volume is Northern red oak *(Q. rubra)*.
[3] Approximately fourth-fifths of this volume is Chestnut Oak *(Q. prinus)*.
[4] Approximately three-fifths of this volume is black oak *(Q. velutina)* and another 30 percent is Scarlet oak *(Q. coccinea)*.
[5] Approximately one fourth of this volume is elm *(Ulmus spp.)* and another one-fifth is Sycamore *(Platanus occidentalis)*. The remainder is divided among a great variety of species.

Table 22.—*Volume of sawtimber on commercial forest land by species and diameter classes, Kentucky, 1963*

(In thousand board feet)[1]

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9[2]	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0 and larger
Softwoods:									
Shortleaf pine	698,140	183,890	198,000	165,070	87,390	37,430	12,300	13,370	690
Other yellow pines	729,010	260,280	202,550	148,540	76,440	28,670	7,570	4,330	630
White pine	31,510	11,990	1,910	1,640	2,720	5,040	4,910	1,340	1,960
Hemlock	144,980	17,450	21,880	12,740	13,880	17,550	14,720	11,890	34,870
Redcedar	96,930	39,260	23,020	13,460	16,010	3,870	1,310	—	—
Cypress	59,620	—	—	5,620	2,670	7,930	—	—	43,400
Other	5,690	—	—	2,710	—	—	—	2,980	—
Total softwoods	1,765,880	512,870	447,360	349,780	199,110	100,490	40,810	33,910	81,550
Hardwoods:									
Select white oak	3,235,350	—	994,960	822,050	538,270	347,660	209,160	107,130	216,120
Select red oak	1,600,820	—	259,210	264,590	243,650	230,160	147,190	126,260	329,760
Other white oak	2,320,170	—	525,620	501,010	369,010	257,350	121,510	137,100	408,570
Other red oak	5,684,010	—	1,098,490	1,274,110	1,085,290	780,210	505,810	330,920	609,180
Hickories	2,909,970	—	902,130	661,280	482,060	318,510	187,010	130,730	228,250
Yellow birch	6,270	—	50	1,080	1,780	160	3,200	—	—
Hard maple	542,630	—	137,020	132,170	79,190	49,330	36,760	29,570	78,590
Beech	1,473,700	—	167,190	184,460	191,720	225,040	138,690	143,030	423,570
Black walnut	188,160	—	64,390	49,350	44,090	17,950	7,390	4,910	80
Ash	521,430	—	149,080	114,550	82,950	40,610	33,610	29,940	70,690
Soft maple	710,730	—	143,480	145,470	111,380	74,530	67,230	60,080	108,560
Sweetgum	602,010	—	149,680	130,860	131,110	78,200	41,700	26,890	43,570
Blackgum	499,020	—	106,100	87,820	134,480	63,900	51,730	25,700	29,290
Cottonwood	294,380	—	4,690	16,350	33,190	47,130	47,880	43,220	101,920
Yellow-poplar	2,201,440	—	556,040	448,540	397,070	318,260	182,280	116,820	182,430
Basswood	257,800	—	40,730	54,760	49,500	12,080	59,030	8,510	33,190
Other	1,334,340	—	345,620	265,460	216,600	171,380	127,800	75,880	131,600
Total hardwoods	24,382,230	—	5,644,480	5,153,910	4,191,340	3,032,460	1,967,980	1,396,690	2,995,370
All species	26,148,110	512,870	6,091,840	5,503,690	4,390,450	3,132,950	2,008,790	1,430,600	3,076,920

[1] International ¼-inch rule.

[2] Softwoods only.

Table 23.—*Volume of growing stock on commercial forest land, by species and forest survey units, Kentucky, 1963*
(In thousand cubic feet)

Species	All units	Western	Western Coalfield	Pennyroyal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	208,660	1,420	—	14,160	3,030	49,560	129,820	10,670
Other yellow pines	228,200	—	3,230	42,510	10,570	70,310	84,570	17,010
White pine	9,340	—	—	—	—	8,830	510	—
Hemlock	42,050	—	370	20	—	12,950	21,280	7,430
Redcedar	57,350	1,230	12,470	21,960	19,050	410	2,230	—
Cypress	7,730	2,410	5,320	—	—	—	—	—
Other	1,340	—	—	—	—	—	700	640
Total softwoods	554,670	5,060	21,390	78,650	32,650	142,060	239,110	35,750
Hardwoods:								
Select white oak	999,490	85,510	164,190	188,910	57,310	189,390	223,990	90,190
Select red oak	349,390	26,280	77,800	58,240	13,300	47,810	59,830	66,130
Other white oak	635,710	47,440	65,830	92,870	20,720	130,070	147,650	131,130
Other red oak	1,382,080	145,920	203,290	178,810	46,470	307,820	305,940	193,830
Hickories	953,970	81,790	159,650	192,070	53,800	124,140	177,310	165,210
Yellow birch	2,090	—	—	—	—	420	1,130	540
Hard maple	189,230	9,990	41,800	51,530	16,700	12,260	25,340	31,610
Beech	306,040	1,520	41,500	63,920	5,160	37,530	68,520	87,890
Black walnut	66,750	1,430	11,840	19,050	10,990	7,540	9,530	6,370
Ash	192,810	22,440	49,110	47,090	27,980	10,520	19,260	16,410
Soft maple	227,290	23,940	37,670	21,270	11,130	20,800	62,230	50,250
Sweetgum	163,880	68,190	61,560	11,650	1,930	1,570	17,260	1,720
Blackgum	134,420	8,450	23,780	30,580	2,640	9,560	33,970	25,440
Cottonwood	48,430	30,880	14,520	1,980	580	420	50	—
Yellow-poplar	631,300	7,690	49,890	108,720	13,850	112,660	163,570	174,920
Basswood	55,410	430	240	2,150	1,400	7,500	11,370	32,320
Other	496,740	74,470	133,220	85,080	64,150	26,060	47,150	66,610
Total hardwoods	6,835,030	636,370	1,135,890	1,153,920	348,110	1,046,070	1,374,100	1,140,570
All species	7,389,700	641,430	1,157,280	1,232,570	380,760	1,188,130	1,613,210	1,176,320

Table 24.—*Volume of sawtimber on commercial forest land, by species and forest survey units, Kentucky, 1963*

(In thousand board feet)[1]

Species	All units	Western	Western Coalfield	Pennyroyal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	698,140	8,610	—	40,890	10,310	199,930	386,190	52,210
Other yellow pines	729,010	—	8,230	175,410	30,240	208,830	250,650	55,650
White pine	31,510	—	—	—	—	31,320	190	—
Hemlock	144,980	—	2,450	60	—	34,860	69,840	37,770
Redcedar	96,930	1,850	26,280	24,780	39,590	580	3,850	—
Cypress	59,620	14,190	45,430	—	—	—	—	—
Other	5,690	—	—	—	—	—	2,980	2,710
Total softwoods	1,765,880	24,650	82,390	241,140	80,140	475,520	713,700	148,340
Hardwoods:								
Select white oak	3,235,350	341,260	660,450	651,590	154,040	499,780	579,840	348,390
Select red oak	1,600,820	134,950	357,220	265,860	55,670	213,830	252,000	321,290
Other white oak	2,320,170	161,120	232,030	303,050	57,480	424,670	496,750	645,070
Other red oak	5,684,010	642,300	886,340	665,500	140,830	1,256,640	1,156,970	935,430
Hickories	2,909,970	302,850	442,630	551,070	150,340	300,730	513,690	648,660
Yellow birch	6,270	—	—	—	—	160	2,910	3,200
Hard maple	542,630	32,860	82,750	146,040	38,010	29,460	67,470	146,040
Beech	1,473,700	7,010	195,090	310,880	27,390	161,230	304,230	467,870
Black walnut	188,160	7,110	36,950	48,840	30,100	18,070	20,860	26,230
Ash	521,430	70,460	104,820	129,300	66,230	28,670	49,730	72,220
Soft maple	710,730	94,260	140,770	52,140	29,240	52,660	141,350	200,310
Sweetgum	602,010	263,770	224,340	39,040	8,090	4,650	55,860	6,260
Blackgum	499,020	21,460	84,650	104,290	9,580	35,660	119,440	123,940
Cottonwood	294,380	197,950	78,100	12,520	3,710	2,020	80	—
Yellow-poplar	2,201,440	38,980	241,760	433,460	59,360	356,800	470,190	600,890
Other	1,334,340	267,110	382,860	215,690	129,860	45,080	102,990	190,750
Basswood	257,800	2,750	1,550	9,030	4,710	29,080	49,770	160,910
Total hardwoods	24,382,230	2,586,200	4,152,310	3,938,300	964,640	3,459,190	4,384,130	4,897,460
All species	26,148,110	2,610,850	4,234,700	4,179,440	1,044,780	3,934,710	5,097,830	5,045,800

[1] International ¼-inch rule.

Table 25.—*Volume of sawtimber on commercial forest land, by species and log grades, Kentucky, 1963*

(In thousand board feet)[1]

Species	All grades	Log grades			
		1	2	3	4
Softwoods:					
Shortleaf pine	698,140	24,990	111,040	458,670	103,440
Other yellow pines	729,010	16,900	73,490	415,050	223,570
White pine	31,510	370	7,600	10,730	12,810
Hemlock	144,980	5,690	14,320	85,460	39,510
Redcedar	96,930	96,930	—	—	—
Cypress	59,620	15,620	8,450	28,670	6,880
Other	5,690	170	3,400	1,650	470
Total softwoods	1,765,880	160,670	218,300	1,000,230	386,680
Hardwoods:					
Select white oak	3,235,350	399,890	744,400	1,468,460	622,600
Select red oak	1,600,820	558,320	389,870	552,480	100,150
Other white oak	2,320,170	442,410	643,190	969,730	264,840
Other red oak	5,684,010	1,126,430	1,311,750	1,912,130	1,333,700
Hickories	2,909,970	582,790	597,740	1,271,650	457,790
Yellow birch	6,270	80	1,810	2,530	1,850
Hard maple	542,630	28,310	111,080	230,640	172,600
Beech	1,473,700	178,780	164,750	561,240	568,930
Black walnut	188,160	30,820	46,580	100,060	10,700
Ash	521,430	85,210	140,080	211,450	84,690
Soft maple	710,730	150,430	99,980	310,020	150,300
Sweetgum	602,010	152,410	103,020	281,050	65,530
Blackgum	499,020	40,510	181,100	218,360	59,050
Cottonwood	294,380	129,120	41,340	81,240	42,680
Yellow-poplar	2,201,440	389,420	541,780	922,670	347,570
Basswood	257,800	100,120	57,720	86,500	13,460
Other	1,334,340	238,100	275,760	621,040	199,440
Total hardwoods	24,382,230	4,633,150	5,451,950	9,801,250	4,495,880
All species	26,148,110	4,793,820	5,670,250	10,801,480	4,882,560

Table 26.—*Volume of salvable dead sawtimber-size trees on commercial forest land, by species groups, Kentucky, 1963*

(In thousand board feet)[1]

Species group	Volume
Softwoods	3,300
Hardwoods	40,180
All species	43,480

[1] International ¼-inch rule.

Table 27.—*Volume of growing stock on commercial forest land, by species, Kentucky, 1949 and 1963*

(In thousand cubic feet)

Species	1949	1963
Softwoods:		
Shortleaf pine	213,100	208,660
Other yellow pines	174,800	228,200
Other softwoods	126,800	117,810
Total softwoods	514,700	554,670
Hardwoods:		
White oaks	1,603,300	1,635,200
Red oaks	1,633,500	1,731,470
Hickory	869,200	953,970
Hard maple	173,700	189,230
Beech	395,200	306,040
Black walnut	100,200	66,750
Ash	167,500	192,810
Soft maple	135,900	227,290
Sweetgum	142,900	163,880
Blackgum	160,400	134,420
Yellow-poplar	439,900	631,300
Basswood	113,400	55,410
Elm	172,100	129,630
Sycamore	86,700	90,510
Other hardwoods	387,300	327,120
Total hardwoods	6,581,200	6,835,030
All species	7,095,900	7,389,700

Table 28.—*Volume of sawtimber on commercial forest land, by species, Kentucky, 1949 and 1963*

(In thousand board feet)[1]

Species	1949	1963
Softwoods:		
Shortleaf pine	978,000	698,140
Other yellow pines	523,000	729,010
Other softwoods	453,000	338,730
Total softwoods	1,954,000	1,765,880
Hardwoods:		
White oaks	5,182,000	5,555,520
Red oaks	6,457,000	7,284,830
Hickory	2,631,000	2,909,970
Hard maple	526,000	542,630
Beech	1,959,000	1,473,700
Black walnut	266,000	188,160
Ash	418,000	521,430
Soft maple	326,000	710,730
Sweetgum	462,000	602,010
Blackgum	584,000	499,020
Yellow-poplar	1,830,000	2,201,440
Basswood	509,000	257,800
Elm	357,000	288,000
Sycamore	347,000	379,960
Other hardwoods	847,000	967,030
Total hardwoods	22,701,000	24,382,230
All species	24,655,000	26,148,110

[1] International ¼-inch rule.

Table 29.—*Volume of growing stock and sawtimber on commercial forest land, by counties and species classes, Kentucky, 1963*

WESTERN UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Ballard	49,640	360	49,280	223,220	1,980	221,240
Calloway	58,380	750	57,630	233,120	3,930	229,190
Carlisle	44,050	360	43,690	188,790	2,120	186,670
Fulton	28,530	320	28,210	125,620	1,880	123,740
Graves	48,450	760	47,690	180,300	3,870	176,430
Hickman	40,900	210	40,690	179,900	1,040	178,860
Livingston	61,730	270	61,460	242,300	1,030	241,270
Lyon	72,030	480	71,550	278,540	2,020	276,520
McCracken	37,480	320	37,160	159,300	1,690	157,610
Marshall	58,550	260	58,290	239,820	1,090	238,730
Trigg	141,690	970	140,720	559,940	4,000	555,940
Total	641,430	5,060	636,370	2,610,850	24,650	2,586,200

Continued

Table 29.— *Continued*

WESTERN COALFIELD UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	*Thousand board feet*[1]
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	Hard-woods
Allen	53,630	950	52,680	197,910	3,780	194,130
Barren	47,310	1,380	45,930	270,330	10,020	260,310
Butler	87,120	1,230	85,890	325,680	2,960	322,720
Caldwell	48,820	920	47,900	172,090	3,580	168,510
Christian	84,200	1,270	82,930	309,660	3,150	306,510
Crittenden	52,360	780	51,580	184,700	2,120	182,580
Daviess	42,380	890	41,490	161,280	4,460	156,820
Edmonson	48,730	2,010	46,720	85,320	4,020	81,300
Henderson	38,360	460	37,900	146,190	1,860	144,330
Hopkins	109,160	1,710	107,450	401,400	6,210	395,190
Logan	65,030	1,080	63,950	228,590	4,230	224,360
McLean	31,720	350	31,370	121,900	1,320	120,580
Monroe	64,640	1,390	63,250	232,020	5,690	226,330
Muhlenberg	91,540	1,210	90,330	332,420	3,420	329,000
Ohio	122,400	2,600	119,800	445,380	13,150	432,230
Simpson	14,310	300	14,010	52,180	1,470	50,710
Todd	36,550	580	35,970	134,890	1,120	133,770
Union	22,950	550	22,400	86,440	3,140	83,300
Warren	57,920	1,110	56,810	210,080	4,320	205,760
Webster	38,150	620	37,530	136,240	2,370	133,870
Total	1,157,280	21,390	1,135,890	4,234,700	82,390	4,152,310

PENNYROYAL UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Adair	52,030	2,910	49,120	165,410	7,770	157,640
Breckenridge	90,660	4,070	86,590	318,100	12,890	305,210
Bullit	65,610	3,320	62,290	225,440	11,060	214,380
Casey	96,770	3,830	92,940	332,240	11,550	320,690
Clinton	38,900	1,940	36,960	134,120	6,170	127,950
Cumberland	64,410	3,180	61,230	214,510	8,210	206,300
Grayson	61,530	3,610	57,920	209,070	9,890	199,180
Green	32,880	1,470	31,410	113,910	4,240	109,670
Hancock	29,520	1,200	28,320	100,120	3,120	97,000
Hardin	83,590	4,160	79,430	284,120	11,940	272,180
Hart	64,550	2,930	61,620	223,560	9,380	214,180
Larue	33,670	1,510	32,160	117,950	5,250	112,700
Marion	43,970	2,310	41,660	141,880	5,860	136,020
Meade	46,010	3,490	42,520	155,230	12,410	142,820
Metcalfe	52,220	2,650	49,570	177,320	7,430	169,890
Nelson	64,580	4,420	60,160	224,320	14,670	209,650
Pulaski	136,110	19,000	117,110	453,570	59,270	394,300
Russell	39,030	1,900	37,130	123,310	4,770	118,540
Taylor	41,960	1,900	40,060	146,230	5,930	140,300
Wayne	94,570	8,850	85,720	319,030	29,330	289,700
Total	1,232,570	78,650	1,153,920	4,179,440	241,140	3,938,300

Continued

Table 29.— *Continued*

BLUEGRASS UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Anderson	10,750	850	9,900	26,290	1,550	24,740
Bath	29,630	4,600	25,030	90,720	13,990	76,730
Boone	14,670	780	13,890	38,040	1,440	36,600
Bourbon	1,070	80	990	2,230	30	2,200
Boyle	8,030	410	7,620	22,620	410	22,210
Bracken	11,670	640	11,030	31,380	1,210	30,170
Campbell	7,860	500	7,360	19,580	950	18,630
Carroll	8,260	490	7,770	20,960	690	20,270
Clark	3,430	260	3,170	9,540	640	8,900
Fayette	1,260	40	1,220	2,550	70	2,480
Fleming	28,820	1,060	27,760	91,600	1,380	90,220
Franklin	14,230	1,160	13,070	36,970	2,480	34,490
Gallatin	5,590	570	5,020	15,040	1,540	13,500
Garrard	9,150	1,080	8,070	24,070	2,790	21,280
Grant	9,600	540	9,060	24,110	990	23,120
Harrison	10,580	520	10,060	27,920	910	27,010
Henry	13,440	1,190	12,250	32,670	3,220	29,450
Jefferson	12,170	1,370	10,800	33,190	3,700	29,490
Jessamine	4,170	230	3,940	11,720	320	11,400
Kenton	8,930	660	8,270	22,570	1,390	21,180
Lincoln	29,750	1,580	28,170	96,140	2,980	93,160
Madison	16,160	3,010	13,150	48,310	10,310	38,000
Mason	4,510	210	4,300	10,660	310	10,350
Mercer	4,030	360	3,670	9,660	360	9,300
Montgomery	6,480	590	5,890	16,810	900	15,910
Nicholas	6,400	410	5,990	15,690	750	14,940

Oldham	7,610	1,280	6,330	25,130	4,750	20,380
Owen	26,180	2,410	23,770	65,750	6,440	59,310
Pendleton	12,560	800	11,760	34,910	1,800	33,110
Robertson	3,350	210	3,140	7,420	350	7,070
Scott	7,350	350	7,000	19,410	740	18,670
Shelby	9,150	1,160	7,990	24,410	3,280	21,130
Spencer	8,090	1,600	6,490	18,850	4,210	14,640
Trimble	9,540	690	8,850	25,580	1,520	24,060
Washington	14,310	800	13,510	37,620	1,430	36,190
Woodford	1,980	160	1,820	4,660	310	4,350
Total	380,760	32,650	348,110	1,044,780	80,140	964,640

NORTHERN CUMBERLAND UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Boyd	34,880	5,870	29,010	120,180	21,360	98,820
Carter	106,120	13,070	93,050	359,390	44,770	314,620
Elliott	77,680	13,800	63,880	266,860	46,700	220,160
Greenup	97,020	9,430	87,590	342,550	34,740	307,810
Johnson	86,220	7,370	78,850	302,470	28,190	274,280
Lawrence	95,480	10,380	85,100	281,350	36,560	244,790
Lewis	158,420	10,300	148,120	574,760	38,440	536,320
Magoffin	88,170	6,070	82,100	290,320	20,430	269,890
Menifee	90,750	17,390	73,360	272,290	51,680	220,610
Morgan	107,870	10,140	97,730	362,570	33,700	328,870
Powell	61,060	5,920	55,140	197,590	19,720	177,870
Rowan	107,400	14,150	93,250	316,320	42,400	273,920
Wolfe	77,060	18,170	58,890	248,060	56,830	191,230
Total	1,188,130	142,060	1,046,070	3,934,710	475,520	3,459,190

Continued

Table 29.— *Continued*

SOUTHERN CUMBERLAND UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Bell	137,300	11,560	125,740	458,840	37,910	420,930
Breathitt	191,210	15,020	176,190	643,080	47,640	595,440
Clay	168,750	16,090	152,660	577,670	51,410	526,260
Estill	87,340	8,090	79,250	290,070	23,590	266,480
Jackson	125,420	13,940	111,480	351,500	41,940	309,560
Knox	112,600	9,120	103,480	368,770	29,170	339,600
Laurel	138,300	36,370	101,930	433,150	107,560	325,590
Lee	73,900	9,200	64,700	238,300	29,030	209,270
McCreary	245,560	75,070	170,490	667,850	213,780	454,070
Owsley	55,850	5,060	50,790	174,930	14,100	160,830
Rockcastle	105,860	10,360	95,500	344,000	31,550	312,450
Whitley	171,120	29,230	141,890	549,670	86,020	463,650
Total	1,613,210	239,110	1,374,100	5,097,830	713,700	4,384,130

EASTERN UNIT

County	Growing stock			Sawtimber		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Thousand cubic feet	*Thousand cubic feet*	*Thousand cubic feet*	*Thousand board feet*[1]	*Thousand board feet*[1]	*Thousand board feet*[1]
Floyd	128,140	3,390	124,750	549,060	13,490	535,570
Harlan	166,720	4,810	161,910	723,870	20,000	703,870
Knott	133,430	4,070	129,360	578,440	17,470	560,970
Leslie	140,590	4,510	136,080	597,820	18,080	579,740
Letcher	122,070	3,780	118,290	525,150	16,110	509,040
Martin	92,720	2,620	90,100	406,700	11,480	395,220
Perry	127,000	4,270	122,730	541,810	18,690	523,120
Pike	265,650	8,300	257,350	1,122,950	33,020	1,089,930
Total	1,176,320	35,750	1,140,570	5,045,800	148,340	4,897,460

ALL UNITS

All counties	7,389,700	554,670	6,835,030	26,148,110	1,765,880	24,382,230

[1] International ¼-inch rule.

Table 30.—*Net annual growth of growing stock on commercial forest land, by species and forest survey units, Kentucky, 1963*

(In thousand cubic feet)

Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	11,500	100	—	1,070	200	3,550	5,860	720
Other yellow pines	16,860	—	340	3,420	1,170	5,270	5,240	1,420
White pine	540	—	—	—	—	510	30	—
Hemlock	2,000	—	10	—	—	760	860	370
Redcedar	3,980	110	730	1,550	1,390	10	190	—
Cypress	340	160	180	—	—	—	—	—
Other	60	—	—	—	—	—	40	20
Total softwoods	35,280	370	1,260	6,040	2,760	10,100	12,220	2,530
Hardwoods:								
Select white oak	43,450	3,870	5,980	8,220	3,490	8,950	9,010	3,930
Select red oak	15,270	1,090	3,530	2,580	840	2,060	2,240	2,930
Other white oak	23,920	2,180	2,220	3,760	1,290	5,630	5,570	3,270
Other red oak	59,490	7,280	9,180	9,330	2,910	12,850	10,160	7,780
Hickories	38,560	2,970	6,560	8,110	2,620	6,380	6,010	5,910
Yellow birch	80	—	—	—	—	20	50	10
Hard maple	9,220	520	2,160	2,610	980	650	1,250	1,050
Beech	6,960	60	1,210	1,870	130	1,000	1,470	1,220
Black walnut	3,640	70	630	860	620	520	540	400
Ash	9,980	1,350	2,490	2,350	1,800	540	1,060	390
Soft maple	12,450	1,040	1,900	1,730	790	1,340	3,150	2,500
Sweetgum	8,290	3,240	2,920	610	90	260	980	190
Blackgum	5,820	520	720	1,530	160	530	1,450	910
Cottonwood	1,900	1,020	740	90	20	30	—	—
Yellow-poplar	54,160	380	3,110	8,750	1,090	11,150	13,510	16,170
Basswood	2,810	20	10	140	40	420	340	1,840
Other	30,470	3,830	7,900	6,200	4,990	1,390	2,440	3,720
Total hardwoods	326,470	29,440	51,260	58,740	21,860	53,720	59,230	52,220
All species	361,750	29,810	52,520	64,780	24,620	63,820	71,450	54,750

Table 31.—*Net annual growth of sawtimber on commercial forest land, by species and forest survey units, Kentucky, 1963*

(In thousand board feet)[1]

Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	54,900	590	—	4,280	1,680	19,680	25,650	3,020
Other yellow pines	85,590	—	870	16,920	5,490	27,990	26,920	7,400
White pine	3,120	—	—	—	—	2,600	520	—
Hemlock	8,840	—	90	—	—	3,210	3,550	1,990
Redcedar	12,200	110	2,590	4,520	4,360	110	510	—
Cypress	2,020	1,060	960	—	—	—	—	—
Other	80	—	—	—	—	—	40	40
Total softwoods	166,750	1,760	4,510	25,720	11,530	53,590	57,190	12,450
Hardwoods:								
Select white oak	224,220	19,620	37,010	43,170	15,820	44,640	45,750	18,210
Select red oak	82,070	7,150	18,600	13,020	3,310	12,050	11,370	16,570
Other white oak	124,580	11,690	17,910	18,840	6,050	26,560	25,170	18,360
Other red oak	322,850	40,340	53,530	48,420	10,530	69,580	55,610	44,840
Hickories	157,200	13,570	27,620	34,770	9,820	22,690	21,050	27,680
Yellow birch	700	—	—	—	—	330	330	40
Hard maple	39,320	1,770	11,870	9,840	4,690	2,550	3,160	5,440
Beech	44,590	140	8,000	12,250	680	5,180	9,430	8,910
Black walnut	16,040	270	3,010	3,900	2,550	2,040	2,230	2,040
Ash	40,560	5,360	11,460	8,960	5,840	2,310	3,700	2,930
Soft maple	54,330	4,990	9,470	6,180	4,900	5,210	9,500	14,080
Sweetgum	45,900	21,370	15,360	3,540	700	430	4,090	410
Blackgum	28,350	1,270	3,290	8,270	480	2,020	7,750	5,270
Cottonwood	15,870	9,980	5,010	520	120	240	—	—
Yellow-poplar	237,570	2,570	17,480	46,820	3,740	38,300	56,000	72,660
Basswood	15,970	100	100	720	210	3,290	2,120	9,430
Other	107,850	10,980	34,140	20,920	13,720	4,770	10,030	13,290
Total softwoods	1,557,970	151,170	273,860	280,140	83,160	242,190	267,290	260,160
All species	1,724,720	152,930	278,370	305,860	94,690	295,780	324,480	272,610

[1] International ¼-inch rule.

Table 32.—*Annual mortality of growing stock and sawtimber on commercial forest land, by species, Kentucky, 1963*

Species	Growing stock	Sawtimber
	M cubic feet	*M board feet*[1]
Softwoods:		
Shortleaf pine	590	2,760
Other yellow pines	110	—
White pine	10	40
Hemlock	—	—
Redcedar	—	—
Cypress	—	—
Other	60	190
Total softwoods	770	2,990
Hardwoods:		
Select white oak	740	950
Select red oak	520	2,870
Other white oak	1,030	2,500
Other red oak	3,250	8,100
Hickories	2,030	8,190
Yellow birch	—	—
Hard maple	120	690
Beech	130	870
Black walnut	330	430
Ash	790	1,580
Soft maple	370	710
Sweetgum	130	50
Blackgum	350	2,150
Cottonwood	—	—
Yellow-poplar	1,150	3,860
Basswood	—	—
Other	2,670	6,440
Total hardwoods	13,610	39,390
All species	14,380	42,380

[1] International ¼-inch rule.

Table 33.—*Annual mortality of growing stock and sawtimber on commercial forest land by ownership and species classes, Kentucky, 1963*

Ownership class	All species	Softwoods	Hardwoods
	GROWING STOCK		
	(In thousand cubic feet)		
National forest	1,980	360	1,620
Other public	480	110	370
Forest industry	370	20	350
Farmer and miscellanous private	11,550	280	11,270
All ownerships	14,380	770	13,610
	SAWTIMBER		
	(In thousand board feet)[1]		
National forest	5,450	1,120	4,330
Other public	1,500	30	1,470
Forest industry	1,280	130	1,150
Farmer and miscellaneous private	34,150	1,710	32,440
All ownerships	42,380	2,990	39,390

[1] International ¼-inch rule.

Table 34.—*Annual mortality of growing stock and sawtimber on commercial forest land, by causes and species classes, Kentucky, 1963*

Cause of death	All species	Softwoods	Hardwoods
	GROWING STOCK (In thousand cubic feet)		
Fire	1,150	—	1,150
Insects	270	—	270
Disease	1,770	—	1,770
Other and unknown	11,190	770	10,420
All causes	14,380	770	13,610
	SAWTIMBER (In thousand board feet)[1]		
Fire	2,570	—	2,570
Insects	1,300	10	1,290
Disease	5,150	—	5,150
Other and unknown	33,360	2,980	30,380
All causes	42,380	2,990	39,390

[1] International ¼-inch rule.

Table 35.—*Timber cut for products from growing stock on commercial forest land, by species and forest survey units, Kentucky, 1962*

(In thousand cubic feet)

Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	5,210	70	—	670	410	1,170	2,450	440
Other yellow pines	1,550	—	290	330	40	470	370	50
White pine	180	—	—	—	—	160	20	—
Hemlock	400	—	—	—	—	130	230	40
Redcedar	1,810	180	410	630	500	50	40	—
Cypress	160	120	40	—	—	—	—	—
Other	20	—	—	—	—	—	—	20
Total softwoods	9,330	370	740	1,630	950	1,980	3,110	550
Hardwoods:								
Select white oak	12,240	800	3,250	3,210	680	1,080	1,730	1,490
Select red oak	23,800	2,190	7,950	6,440	1,090	2,840	2,130	1,160
Other white oak	8,050	800	1,430	1,880	500	700	1,270	1,470
Other red oak	13,310	1,230	3,930	3,940	810	1,670	1,190	540
Hickories	10,660	660	2,820	3,700	730	490	1,120	1,140
Yellow birch	—	—	—	—	—	—	—	—
Hard maple	3,660	170	530	520	150	520	560	1,210
Beech	8,580	130	1,740	2,920	240	880	1,510	1,160
Black walnut	3,100	30	780	220	1,580	220	150	120
Ash	2,490	180	620	490	110	560	410	120
Soft maple	2,860	200	1,680	320	30	330	210	90
Sweetgum	2,240	380	1,610	210	—	20	20	—
Blackgum	1,110	50	490	220	40	80	140	90
Cottonwood	1,850	850	880	40	10	60	10	—
Yellow-poplar	12,510	380	2,370	2,490	250	3,270	2,380	1,370
Basswood	1,830	40	110	130	60	650	540	300
Other	5,680	600	2,770	1,040	250	380	380	260
Total hardwoods	113,970	8,690	32,960	27,770	6,530	13,750	13,750	10,520
All species	123,300	9,060	33,700	29,400	7,480	15,730	16,860	11,070

Table 36.—*Timber cut from products from live sawtimber on commercial forest land, by species and forest survey units, Kentucky, 1962*

(In thousand board feet)[1]

Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	14,360	70	—	1,570	850	2,490	8,030	1,350
Other yellow pines	5,700	—	540	1,290	170	1,940	1,500	260
White pine	870	—	—	—	—	770	100	—
Hemlock	1,940	—	—	10	—	600	1,110	220
Redcedar	3,000	280	410	1,280	950	20	60	—
Cypress	790	600	190	—	—	—	—	—
Other	30	—	—	—	—	—	—	30
Total softwoods	26,690	950	1,140	4,150	1,970	5,820	10,800	1,860
Hardwoods:								
Select white oak	57,190	4,200	14,660	14,570	2,600	6,130	9,750	5,280
Select red oak	127,920	12,410	46,490	28,010	3,750	16,960	13,140	7,160
Other white oak	37,120	4,290	6,540	6,740	1,560	2,850	7,100	8,040
Other red oak	63,110	6,120	21,940	14,810	2,290	8,280	6,350	3,320
Hickories	37,910	2,630	11,170	10,420	1,790	2,210	5,730	3,960
Yellow birch	—	—	—	—	—	—	—	—
Hard maple	18,150	730	2,800	2,990	420	990	2,570	7,650
Beech	51,730	560	11,270	18,960	1,080	3,370	8,840	7,650
Black walnut	21,230	220	5,310	1,510	10,810	1,480	1,060	840
Ash	11,020	850	3,770	2,640	270	1,260	1,470	760
Soft maple	18,380	1,290	10,980	2,040	190	2,030	1,300	550
Sweetgum	14,660	2,490	10,530	1,340	—	140	160	—
Blackgum	7,340	370	3,220	1,410	290	510	950	590
Cottonwood	11,950	5,600	5,830	240	10	260	10	—
Yellow-poplar	83,280	2,500	15,810	16,650	1,670	21,670	15,830	9,150
Basswood	11,510	230	690	810	350	4,030	3,450	1,950
Other	32,660	3,500	16,990	5,540	620	2,070	2,270	1,670
Total hardwoods	605,160	47,990	188,000	128,680	27,700	74,240	79,980	58,570
All species	631,850	48,940	189,140	132,830	29,670	80,060	90,780	60,430

[1] International ¼-inch rule.

Table 37.—*Total output of timber products, by type of material used and species classes, Kentucky, 1962*

Product and species class	Total output in standard units		Output from roundwood		Output from plant byproducts, standard units
	Unit	Number	Standard units	M cubic feet	
Sawlogs and bolts:					
Softwood	M board feet[1]	24,440	24,440	4,368	—
Hardwood	M board feet[1]	435,940	435,940	63,655	—
Total	M board feet[1]	460,380	460,380	68,023	—
Veneer logs:					
Softwood	M board feet[1]	—	—	—	—
Hardwood	M board feet[1]	12,455	12,455	1,604	—
Total	M board feet[1]	12,455	12,455	1,604	—
Cooperage logs:					
Softwood	M board feet[1]	—	—	—	—
Hardwood	M board feet[1]	21,017	21,017	3,297	—
Total	M board feet[1]	21,017	21,017	3,297	—
Pulpwood:					
Softwood	Standard cords[2]	33,694	33,694	2,594	—
Hardwood	Standard cords[2]	48,471	43,471	3,129	5,000
Total	Standard cords[2]	82,165	77,165	5,723	5,000

Continued

Table 37. — *Continued*

Product and species class	Total output in standard units		Output from roundwood		Output from plant byproducts, standard units
	Unit	Number	Standard units	M cubic feet	
Piling:					
Softwood	M linear feet	—	—	—	—
Hardwood	M linear feet	30	30	15	—
Total	M linear feet	30	30	15	—
Poles:					
Softwood	M pieces	5	5	21	—
Hardwood	M pieces	—	—	—	—
Total	M pieces	5	5	21	—
Mine timbers (round):					
Softwood	M cubic feet	283	283	283	—
Hardwood	M cubic feet	4,053	4,053	4,053	—
Total	M cubic feet	4,336	4,336	4,336	—
Miscellaneous industrial wood:[3]					
Softwood	M cubic feet	70	70	70	—
Hardwood	M cubic feet	3,295	2,945	2,945	350
Total	M cubic feet	3,365	3,015	3,015	350
Posts (round and split):					
Softwood	M pieces	1,600	1,600	1,862	—
Hardwood	M pieces	2,000	2,000	2,627	—
Total	M pieces	3,600	3,600	4,489	—

Fuelwood:					
Softwood	Standard cords[2]	10,000	—	—	10,000
Hardwood	Standard cords[2]	670,000	450,000	30,140	220,000
Total	Standard cords[2]	680,000	450,000	30,140	230,000
All products:					
Softwood	M cubic feet	9,967	9,198	9,198	769
Hardwood	M cubic feet	127,426	111,465	111,465	15,961
Total	M cubic feet	137,393	120,663	120,663	16,730

[1] International ¼-inch rule.

[2] Rough wood basis.

[3] Includes charcoal wood, handle bolts, shingle bolts, and the like.

Table 38.—*Total output of roundwood products, by source and species classes, Kentucky, 1962*

(In thousand cubic feet)

Source	All species	Softwoods	Hardwoods
Growing-stock trees[1]			
Sawtimber trees	83,324	4,835	78,489
Poletimber trees	20,945	4,022	16,923
Total	104,269	8,857	95,412
Cull trees[1]	816	83	733
Salvable dead trees[1]	1,786	214	1,572
Other sources[2]	13,792	44	13,748
All sources	120,663	9,198	111,465

[1] On commercial forest land.

[2] Includes noncommercial forest land, nonforest land (like fence rows), trees less than 5.0 inches in diameter, and limbwood.

Table 39.—*Number of operating primary wood-using plants, by forest survey units, Kentucky, 1962*

Kind of plant	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Sawmills:								
Large[1]	8	—	4	1	—	1	1	1
Medium[2]	98	11	26	21	4	13	10	13
Small[3]	465	15	56	140	36	94	74	50
Veneer mills	3	1	—	—	1	—	1	—
Cooperage mills	32	3	6	10	4	3	6	—
Handle plants	9	2	3	3	—	—	1	—
Charcoal plants	6	—	—	2	—	2	2	—
All plants	621	32	95	177	45	113	95	64

[1] Annual production, 5 million board feet or more.
[2] Annual production, 1 to 5 million board feet.
[3] Annual production, less than 1 million board feet.

Table 40.—*Timber cut for products from growing stock on commercial forest land, by products and logging residues and species classes, Kentucky, 1962*

(In thousand cubic feet)

Products and residues	All species	Softwoods	Hardwoods
Roundwood products:			
Sawlogs and bolts	67,020	4,160	62,860
Veneer logs and bolts	1,600	—	1,600
Cooperage logs and bolts	3,300	—	3,300
Pulpwood	5,670	2,540	3,130
Piling	10	—	10
Poles	20	20	—
Mine timbers	4,180	270	3,910
Miscellaneous industrial wood[1]	2,450	70	2,380
Posts	3,060	1,800	1,260
Fuelwood	16,960	—	16,960
All products	104,270	8,860	95,410
Logging residues	19,030	470	18,560
Timber cut	123,300	9,330	113,970

[1] Includes charcoal wood, handle bolts, shingle bolts, and the like.

Table 41.—*Timber cut for products from live sawtimber on commercial forest land, by products and logging residues and species classes, Kentucky, 1962*

(In thousand board feet)[1]

Products and residues	All species	Softwoods	Hardwoods
Roundwood products:			
Sawlogs and bolts	452,150	20,920	431,230
Veneer logs and bolts	12,460	—	12,460
Cooperage logs and bolts	21,020	—	21,020
Pulpwood	5,720	3,510	2,210
Piling	80	—	80
Poles	—	—	—
Mine timbers	8,320	540	7,780
Miscellaneous industrial wood[2]	11,850	410	11,440
Posts	1,950	690	1,260
Fuelwood	33,750	—	33,750
All products	547,300	26,070	521,230
Logging residues	84,550	620	83,930
Timber cut	631,850	26,690	605,160

[1] International ¼-inch rule.

[2] Includes charcoal wood, handle bolts, shingle bolts, and the like.

Table 42.—*Volume of unused plant residues by industrial sources and type of residue, and by species classes, Kentucky, 1962*

(In thousand cubic feet)

Industrial source[1]	Species class and character of residues								
	All species			Softwoods			Hardwoods		
	Total	Coarse[2]	Fine[3]	Total	Coarse	Fine	Total	Coarse	Fine
Lumber industry	12,165	5,230	6,935	725	339	386	11,440	4,891	6,549
Veneer industry	30	—	30	—	—	—	30	—	30
Other primary industries	552	379	173	—	—	—	552	379	173
Total	12,747	5,609	7,138	725	339	386	12,022	5,270	6,752

[1] Includes only those plants using logs and bolts (primary wood-using plants).

[2] Unused material suitable for chipping, like slabs, edgings and veneer cores.

[3] Unused material not suitable for chipping, like sawdust and shavings.

Table 43.—*Estimated average annual removal of growing stock from commercial forest land, 1949-1963*[1]

(In thousand cubic feet)

Item	All species	Softwoods	Hardwoods
Roundwood products	130,000	10,000	120,000
Logging residues	25,000	1,000	24,000
Other removals[2]	134,000	17,000	117,000
Total removals	289,000	28,000	261,000

[1] The data in this table are estimates of average trend removal that occurred during the 14-year interval between forest inventories. They are not necessarily typical of any given year.

[2] Includes for example, timber that was pushed and burned in the process of land clearing for farms, cities, and highways; was cut in non-commercial stand improvement operations; was set aside in state and roadside park developments or converted to other nonforest or non-commercial forest uses; became unmerchantable because of rot or other deformities.

Table 44.—*Net annual desirable cut of growing stock on commercial forest land, by species and forest survey units, Kentucky, 1963*

(In thousand cubic feet)

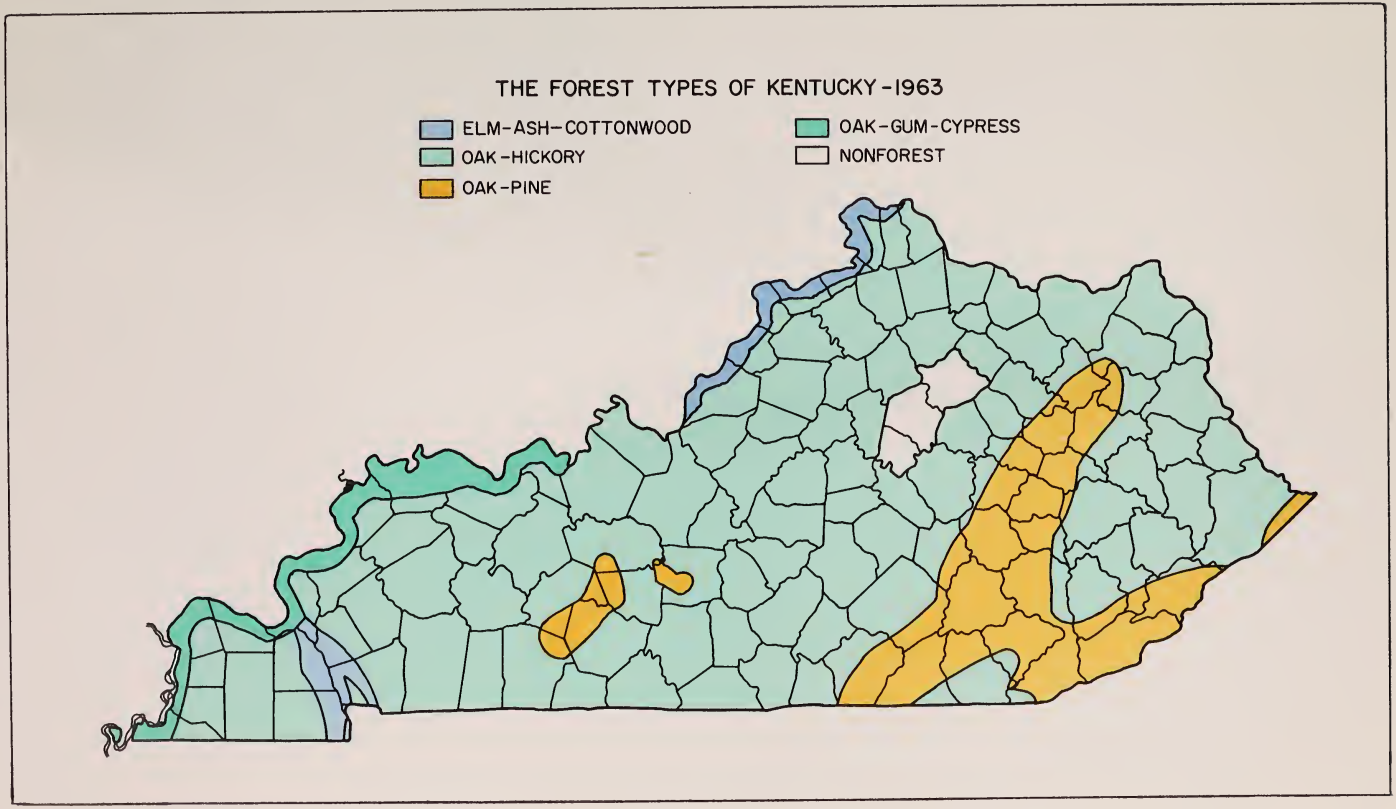
Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	4,440	—	—	250	20	1,490	2,490	190
Other yellow pines	2,750	—	—	440	20	1,150	1,080	60
White pine	150	—	—	—	—	150	—	—
Hemlock	1,100	—	90	—	—	230	580	200
Redcedar	580	10	180	280	100	—	10	—
Cypress	190	80	110	—	—	—	—	—
Other	30	—	—	—	—	—	—	30
Total softwoods	9,240	90	380	970	140	3,020	4,160	480
Hardwoods:								
Select white oak	27,240	2,740	7,380	4,390	510	5,070	3,320	3,830
Select red oak	11,430	760	3,150	1,760	190	1,780	960	2,830
Other white oak	20,410	1,490	2,600	2,930	310	4,630	4,190	4,260
Other red oak	39,070	2,100	5,520	4,840	390	11,890	7,880	6,450
Hickories	25,180	1,820	5,000	5,580	600	2,970	3,390	5,820
Yellow birch	110	—	—	—	—	20	20	70
Hard maple	5,780	300	1,490	1,540	50	240	440	1,720
Beech	9,920	50	1,520	1,970	40	1,110	900	4,330
Black walnut	950	50	110	450	50	140	40	110
Ash	4,480	560	1,050	1,530	110	400	130	700
Soft maple	5,820	580	720	510	170	940	1,030	1,870
Sweetgum	3,640	880	1,540	610	—	30	530	50
Blackgum	4,210	200	840	590	70	340	770	1,400
Cottonwood	1,110	680	390	—	40	—	—	—
Yellow-poplar	14,440	200	1,610	3,070	270	2,140	2,250	4,900
Basswood	1,760	—	—	50	20	180	140	1,370
Other	10,910	1,380	3,160	2,010	320	560	600	2,880
Total hardwoods	186,460	13,790	36,080	31,830	3,140	32,440	26,590	42,590
All species	195,700	13,880	36,460	32,800	3,280	35,460	30,750	43,070

Table 45.—*Net annual desirable cut of live sawtimber on commercial forest land, by species and forest survey units, Kentucky, 1963*

(In thousand board feet)[1]

Species	All units	Western	Western Coalfield	Penny-royal	Blue-grass	Northern Cumberland	Southern Cumberland	Eastern
Softwoods:								
Shortleaf pine	19,170	—	—	950	130	7,150	9,930	1,010
Other yellow pines	9,620	—	—	2,160	100	3,880	3,430	50
White pine	720	—	—	—	—	700	20	—
Hemlock	4,970	—	630	—	—	880	2,530	930
Redcedar	1,010	—	480	50	460	—	20	—
Cypress	1,300	420	880	—	—	—	—	—
Other	210	—	—	—	—	—	—	210
Total softwoods	37,000	420	1,990	3,160	690	12,610	15,930	2,200
Hardwoods:								
Select white oak	97,970	11,350	29,380	15,540	1,640	14,640	8,960	16,460
Select red oak	56,650	4,260	15,460	7,470	1,030	9,380	4,150	14,900
Other white oak	83,460	6,070	8,330	10,360	1,460	17,740	17,010	22,490
Other red oak	185,860	9,270	26,320	20,230	1,740	59,770	33,530	35,000
Hickories	88,350	5,870	14,180	17,260	2,800	10,190	12,050	26,000
Yellow birch	560	—	—	—	—	10	110	440
Hard maple	20,930	1,290	3,910	4,250	210	470	1,930	8,870
Beech	52,010	290	8,180	9,370	200	5,380	4,500	24,090
Black walnut	3,410	310	380	1,420	180	380	110	630
Ash	16,500	1,690	3,350	5,160	510	1,310	520	3,960
Soft maple	21,990	2,840	2,450	1,290	660	2,600	2,870	9,280
Sweetgum	13,940	4,410	5,350	1,760	10	150	1,900	360
Blackgum	17,910	300	3,190	1,950	260	1,040	2,950	8,220
Cottonwood	6,900	4,480	2,110	—	300	10	—	—
Yellow-poplar	61,400	1,150	7,980	11,540	940	9,690	8,400	21,700
Basswood	8,520	—	—	150	90	710	530	7,040
Other	35,410	5,360	10,510	5,940	1,050	1,330	1,530	9,690
Total hardwoods	771,770	58,940	141,080	113,690	13,080	134,800	101,050	209,130
All species	808,770	59,360	143,070	116,850	13,770	147,410	116,980	211,330

[1] International ¼-inch rule.


THE FOREST TYPES OF KENTUCKY-1963
ELM-ASH-COTTONWOOD
OAK-HICKORY
OAK-PINE
OAK-GUM-CYPRESS
NONFOREST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